

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
B 14.0	ELECTRICAL SYSTEMS		B 01
B 14.0.1	General		B 02
(1)	The information included in the following chapters and paragraphs refers to the scope of design for electrotechnical systems in repair projects of barracks buildings.		B 03
(2)	All electrical systems existing in design are included in sections secondary voltage systems or telecommunication and information technical systems.		B 04
B 14.0.2	Regulations		B 05
(1)	All applicable German and U.S. requirements, regulations and standards shall be applied in their latest edition.	VDE, VdS DIN	B 06
(2)	Information about U.S. requirements to be applied shall be obtained from the supporting U.S. agency prior to commencement of design.	NFPA ANSI- Norm C2	B 07
(3)	Where military requirements in the field of public safety and order exceed the German requirements in the individual case, their requirements shall be observed upon applicable request on behalf of the U.S. forces. The armed forces accept the responsibility directly arising from application of these standards. The armed forces attach a detailed description of technical requirements, to be specifically observed. The request shall be filed early enough, to be covered in the costs.		B 08
			B 09
(4)	Where public safety and order is not affected, the forces can request application of their own requirements. The forces accept the directly arising responsibility from application of these standards. The armed forces attach a detailed description of technical requirements, to be specifically observed. The request shall be filed early enough, to be covered in the costs.		B 10
			B 11
B 14.0.3	Design Notes		B 12
(1)	Required calculations of power systems and operating devices, the breaking capacity of equipment, protective devices and conductor cross sections as well as light intensity shall be provided.		B 13
(2)	If switch systems, network transformers or similar systems are existing in objects, these shall be stored intermediate due to reasons of immission protection.	26. BlmSchV	B 14
			B 15

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		SOURCE	
B 14.1	SECONDARY VOLTAGE SYSTEMS		B 01
B 14.1.1	LOW VOLTAGE INSTALLATION SYSTEMS	NFPA VDE 0100	B 02
(1)	Power supply shall be from existing low voltage networks with 400/230 V, 50 Hz, via building distribution panel.		B 03
(2)	A change of the 50 Hz-frequency shall not be provided. Should a frequency of 60 Hz be required, the approval must be obtained from HQ USAREUR, ODCSENGR.		B 04
(3)	With the exception of safety lighting, there is no requirement in the barracks for an application of alternative power sources.	VDE 0108	B 05
(4)	A second 208/120 V system shall be provided in the buildings for supply of NEMA receptacles. If no external 208 V-system exists, three-phase dry transformers shall be installed in each building, 3 x 400/230 V - 3 x 208/120 V, - 5, -2.5, 0, +2.5, +5 %, switching Dyn 5, short circuit voltage approx. 2.5 %, ratio between idle and full load voltage approximately between 2 - 4 %, nominal capacity as required, minimum 20 kVA.		B 06
(5)	A second building distribution panel for the 208/120 V system shall be supplied via the 400/208 V transformer.		B 07
(6)	Both building panels and the transformer shall be housed in a separate electrical room which is generally located in basement. Special attention shall be paid to the determination of room dimensions, to necessary ventilation, transport and mounting conditions as well as the operation space depth.	VDE 0101	B 08
(7)	In case of relocation of the building panel existing prior to alteration measure, preference shall be given to an underground location outside the building as compared to cable installation inside the building, which can be facilitated through relocation of the cable or extension of the feeder cable. The supply cable from outside area into the electrical room shall be led within the building in the shortest possible way.		B 09
			B 10
			B 11
			B 12
			B 13
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(8)

Network Types:

From main connection to building panel: TN-C-network

From building main panel to sub-panels and switch cabinets of mechanical system: TN-S-network.

All power circuits inside the building: Protective measure Neutral with separately installed protective conductor.

SOURCE

B 01

VDE 0100
Part 410

B 02

VDE 0100
Part 540

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

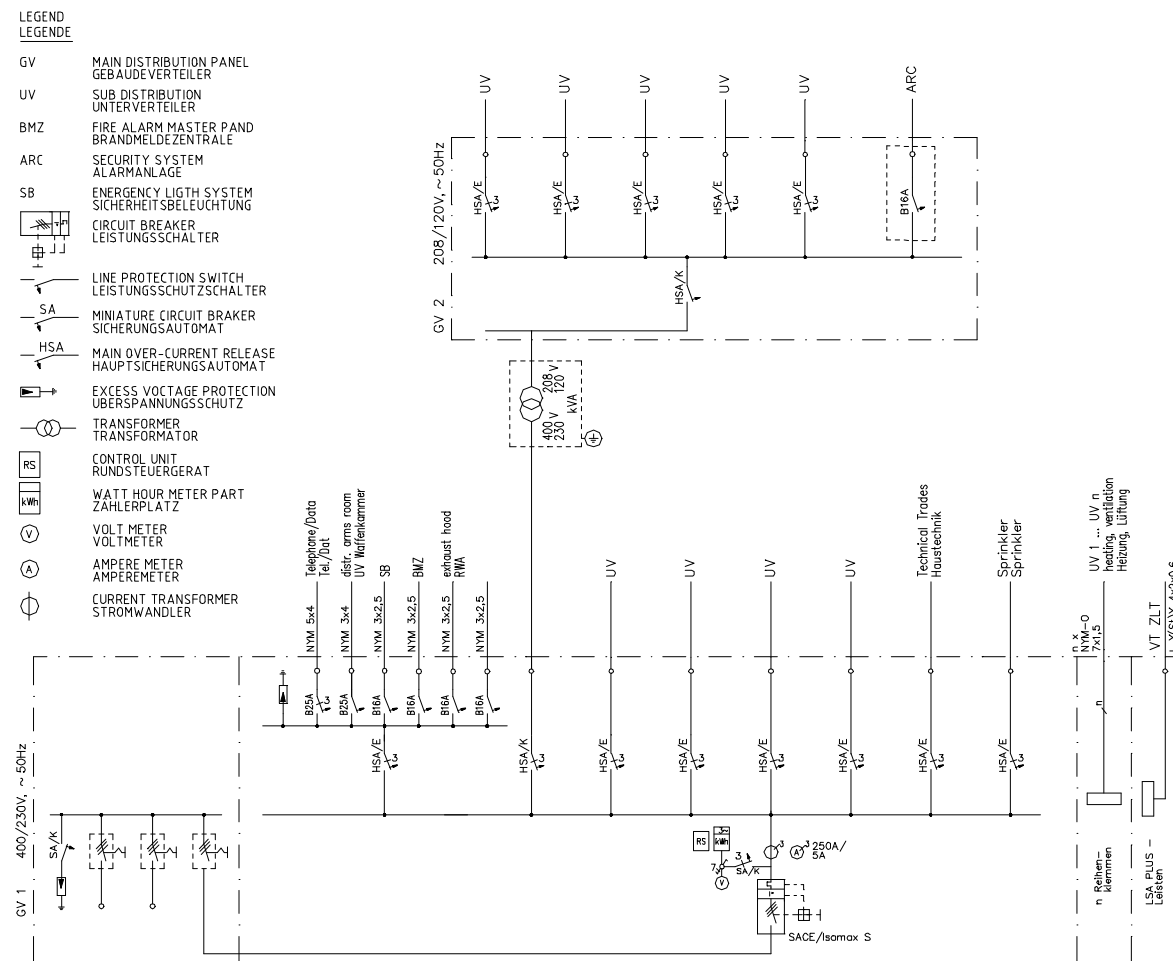
B 13

B 14

B 15

Fig. 14.1

SAMPLE SINGLE LINE DIAGRAM POWER WITH TRANSFORMER 400/208 V
BEISPIEL ÜBERSICHTSSCHEMA STROMVERSORGUNG MIT TRAF0 400/208 V



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B 14.1.2	DISTRIBUTION PANELS		B 01
B 14.1.2.1	Main Distribution Panel		B 02
(1)	2 separate building panels "-BP1" for 400/230 V and "-BP2" for 208/120 V in sheet steel housing as partially type-tested (PTSC) low voltage switch gear combination, rated isolation voltage 660 V AC, in line-up cabinet arrangement, self-supported or wall-mounted, Type of Protection not less than IP 54, Protection Class I, with support frame for permanent equipment installation, with front door, rod or turn bolt lock with cylinder lock, consisting of:	VDE 0660 Part 500 (TSK)	B 03
(2)	Feed-in panel 400/230 V with:		B 04
	- Bus bars with fault arc protected insulation consisting of 3 main buses and PEN-rail of copper, nominal voltage 660 V AC.	VDE 0660 Part 1 and 5	B 05
	- 3-pole load break switches 660 V AC, with manual drive for ring feed-in and building output, selective	VDE 0660 Part 107	B 06
	- Lightning conductor 4-pole with surface discharge route, monitoring and separation device incl. pre-fuse (circuit breaker S 610)	VDE 0185 Part 6	B 07
(3)	Outgoing panel 400/230 V with:		B 08
	- Bus bar with fault arc protected insulation, with 3 main buses, PE and N-rail of copper, nominal voltage 660 V AC	VDE 0660 Part 1 and 5	B 09
	- 3 Bimetal turning iron power meter for mean value display +/- 3 % and maximum value display through time-delayed pointer		B 10
	- 1 turning iron voltage meter with voltage meter change-over switch		B 11
	- Space reserve for 1 meter space and meter breaking equipment with accessories		B 12
	- 1 main switch as compact power switch for system protection acc. to IEC 947-2 and/or VDE 0660, measurement short circuit cut-off capacity 35 at 400 V, fixed installation 3-pole, delay time adjustable 0.1 ... 0.8 s same as: ABB SACE/Isomax S or equal	VDE 0660	B 13
	- Selective main automatic cut-out, voltage independent (SHU-switch) acc. to DIN VDE 0645, 3 x 1-pole per exit release characteristic E, short-circuit switch capacity 25 kA for exits to subdistribution panels, switch cabinets of mechanical, sprinkler system, for exit to transformer 400/208V main automatic cutout with release characteristic K same as ABB S 700 or equal		B 14
	- Fuse circuit breaker for line protection acc. to IEC 947-2, EN 60947-2, DIN VDE or part 101 measurement switch capacity 50 kA release characteristic K same as ABB S 610 or equal		B 15

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	SOURCE	
<ul style="list-style-type: none"> - integrated distribution panel with 4 overvoltage protection conductors C with separate exits with power switches for: <ul style="list-style-type: none"> fire alarm system (power switch in red color) smoke and heat exhaust system magnet card reading system TV system emergency lighting system telephone and data systems subdistribution panel light and receptacles arems room - Miniature circuit breakers 250/440 V AC, breaking capacity 6 kA, release characteristics B - Lightning conductor, 4-pole, with surface discharge route, monitoring and separation device including preliminary protection (circuit breaker S 610) - Space reserve for equipment, wiring, terminals and accessories of not less than 20 % - Terminals for control cable 7 x 1.5 mm² to distribution panels - All equipment on terminals - Electrically and mechanically separated section for installation of LSA-Plus-connector strips for the EMCS-cable. <p>(4) Outgoing panel 208/120V with:</p> <ul style="list-style-type: none"> - Bus bars with fault arc protected insulation, with 3 main buses, PE and N-rail of copper, nominal voltage 660 V AC - 1 main switch (secondary side of transformer) as selective main automatic cut-out, voltage independent (SHU-switch) acc. to DIN VDE 0645, 3-pole, release characteristic K, short circuit cut-off capacity 25 kA, same as: ABB S 700 or equal - Selective main automatic cut-out, voltage independent (SHU-switch) acc. to DIN VDE 0645, 3 x 1-pole per exit, release characteristic E, short-circuit switch capacity 25 kA for exits to subdistribution panels, switch cabinets of mechanical, sprinkler system etc., same as ABB S 700 or equal - Distribution panel with power switch concealed installation, deeper located (with lowering bows)for alarm system in arms room - Miniature circuit breakers 250/440 V AC, breaking capacity 6 kA, release characteristics B - Space reserve for equipment, wiring, terminals and accessories of not less than 20 % - All equipment on terminals <p>(5) Fusible links shall not be used for outgoing cables</p> <p>(6) The type of metering equipment and operating devices shall be coordinated with the local DPW.</p>		B 01
		B 02
		B 03
	VDE 0641 Part 11	B 04
	VDE 0185 Part 6	B 05
		B 06
	DIN 47 614	B 07
		B 08
	VDE 0660 Part 1 and 5	B 09
	VDE 0645	B 10
		B 11
		B 12
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B 14.1.2.2	Distribution/floor	VDE 0603 and 0660 Part 500 DIN 43 870	B 01
B 14.1.2.2.1	Arrangement of Distribution Panels		B 02
(1)	One or more sub-panels with mechanically and electrically separated sections 400/230 V, 208/120 V and EMCS shall be installed on all floors, depending upon the building size.		B 03
(2)	Arrangement of panels in separate rooms as far as existing or in corridors under observance of required protection measures as listed as follows.		B 04
B 14.1.2.2.2	Panel Design		B 05
(1)	Sub-panels as partially tested switch gear combinations (PTSC) wall-mounted installation in rooms and/or wall recesses or flush-mounted, in sheet steel casing, closed all around with door, not lockable, bus bar with 3 main buses, PE and N-rail of copper, nominal voltage 660 V AC.		B 06
(2)	Accomplishment of distribution panels		B 07
	- in separate rooms as stand or wall assembly distribution panels in standard make, not lockable		B 08
	- in escape and exit ways either in wall recesses with not lockable door, fire resistance class I30 or distribution panel flush mounted in protective type IP54 and/or IP 55, fire resistance class I30, door not lockable.		B 09
(3)	Separate small distribution panel with on/off switch for light and receptacle current circuits of arms room with direct supply line from building main distribution panel.		B 10
(4)	Arrangement of distribution panels:		B 11
	- Loop-in space with recesses for lead-in of incoming and outgoing cables and wires with tension relief clamps.		B 12
	- Terminal space for installation of line-up, neutral conductor and protective conductor terminals for each output, N and PE buses are individually loosenable, N-bars as insulated type.		B 13
	- Equipment spaces with equipment carrier, contact protection cover, removable front plate, without distribution panel shut-off.		B 14
	- All equipment and terminals with permanent lettering with Resopal signs, engraved, in English and German, protective conductor with identification spouts.		B 15

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- A complete switch diagram with identification of all equipment, terminals, power circuits and/or users, in permanently attached plan deposit, DIN A4, and a permanently attached power circuit.	DIN 40 900	B 01
- Electrical and mechanical division between sections 400/230 V and 208/120 V and sections 208/120 V and EMCS.		B 02
B 14.1.2.2.3 Distribution Panel Equipment, Power Circuits		B 03
(1) Each 4 overvoltage down-conductors C in 400 V and 208 V panels in all distributions/floor.	DIN VDE 0110-1	B 04
(2) Outputs 400/230 V and 208/120 V to distributions/room of associated floor areas, with 3 x 1-pole main automatic circuit breakers each, release characteristics E, selective, breaking capacity 25 kA.		B 05
(3) Separate power circuits for lighting and receptacles. Max. 8 each Schuko-receptacles 230 V and/or 6 each NEMA-outlets 120 V per receptacle circuit.		B 06
(4) Minimum cross sections for lighting circuits 1.5 mm ² Cu, for receptacle circuits 2.5 mm ² Cu. Other AC and three-phase circuits according to load under observance of permissible voltage drop.		B 07
(5) All miniature circuit breakers according to DIN VDE 0641 in 400V and 208 V-panels with release characteristics B, breaking capacity at least 6 kA, current limiting class 3.		B 08
(6) Receptacle circuits for washers and dryers with combination miniature circuit breakers/FI-fault current interrupter switches 30 mA in sub-panel basement.	VDE 0100 Part 410	B 09
(7) Dryer circuits as one or more groups with main automatic circuit breaker, release characteristics K, selective, breaking capacity 25 kA, with 3-pole AC-contactor for central shut-off via EMCS (load rejection) in sub-panel basement.	VDE 0660 Part 102 CCMS	B 10
(8) All receptacle circuits for wet rooms, kitchens and latrines with combination miniature circuit breaker with ground fault interrupter switch (personal protection), release characteristics B, breaking capacity 6 kA, nominal fault current 10 mA.		B 11
(9) Switching of lighting in staircases and corridors per area via button with impulse relay.		B 12
		B 13
		B 14
		B 15

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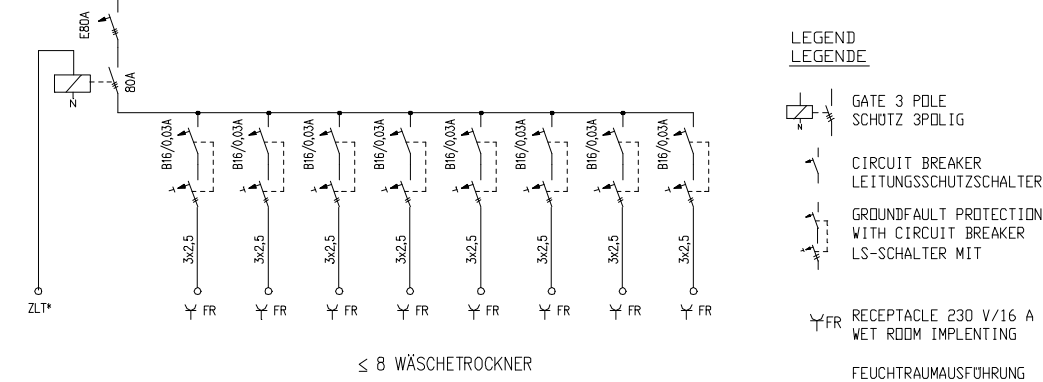
(10)

In corridor in front of arms room between door and service window
1 bulkhead light fixture with switch inside.

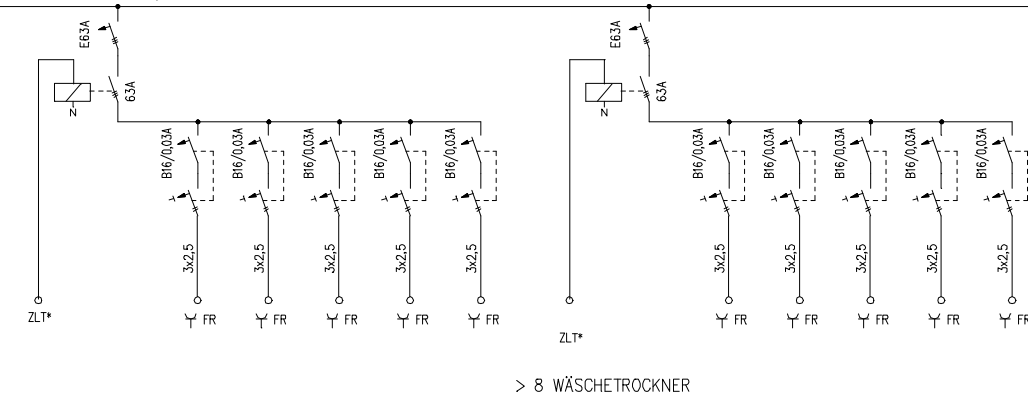
Fig. 14.2

DISTRIBUTION/FLOOR - CENTRAL SHUTTING OF CLOTH DRYER ETAGENVERTEILER - ZENTRALABSCHALTUNG WÄSCHETROCKNER

ETAGENVERTEILER KG
L1,L2,L3,PE,N 400/230V, 50Hz



ETAGENVERTEILER KG
L1,L2,L3,PE,N 400/230V, 50Hz



(11)

Each distribution/floor with power circuits for bathrooms in apartments type 1, 2 and 4 (with each one distribution/room in every walk-in closet):

- 1 receptacle circuit 230 V with 1-pole personal protection device B 13/0.01 A
- 1 receptacle circuit 120 V with 1-pole personal protection device B 13/0.01 A
- 1 power circuit with circuit breaker B 10 A for lighting with follow-up operation fan - step 2
- switching relay with approach via a joint timer for the entire building in floor distribution basement and/or EMCS for switching of fan step 1 stand-by mode. (see Fig. 14.3)

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SOURCE

(12)

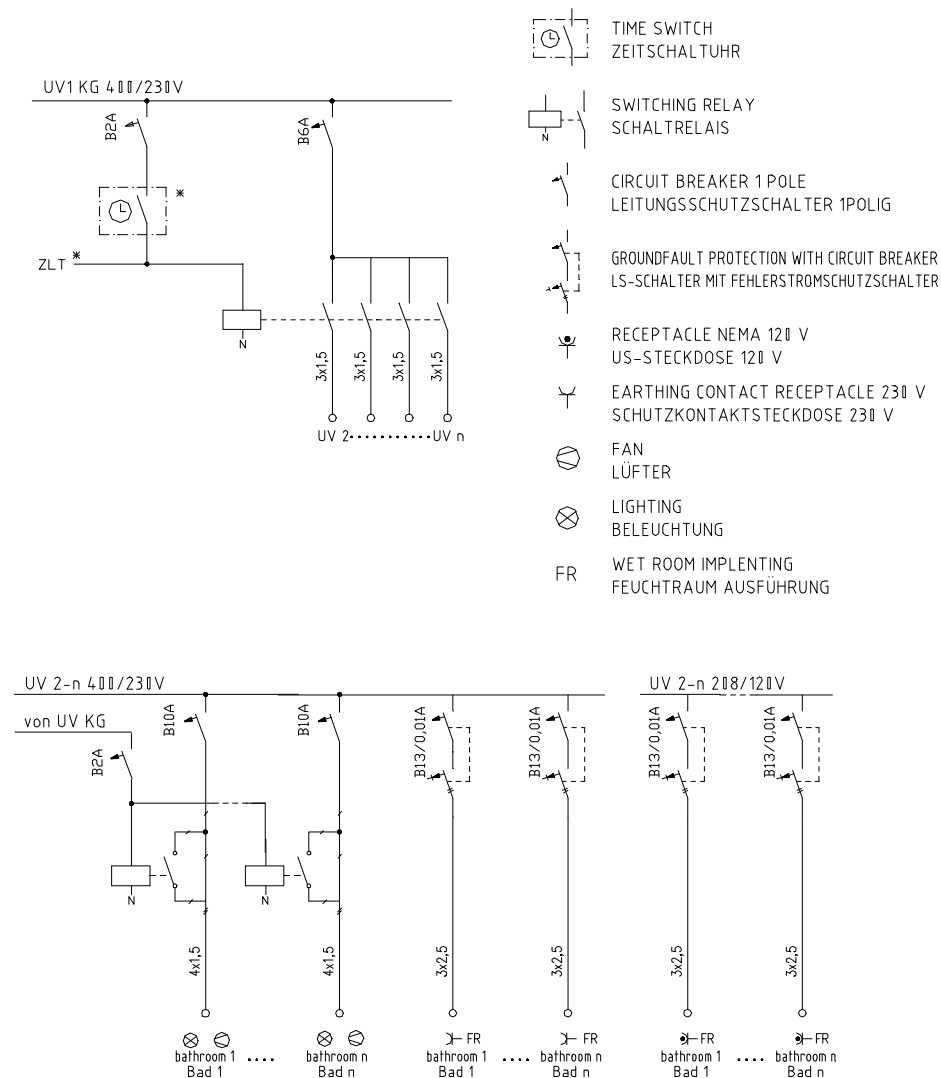
Switching of exterior lighting at the building via photo-electric switch located on the individual light fixtures or with timer or approach via EMCS or existing control as per local conditions upon coordination with the local DPW.

(13)

Each distribution panel with unused space reserve of 20 % for equipment with wiring, terminals and accessories.

Fig 14.3

DISTRIBUTION/FLOOR - HEAD FOR LIGHT+VENTILATION, APARTMENT TYPEN 1, 2,4
ETAGENVERTEILER/ANSTEUERUNG LICHT+LÜFTER BAD, ZIMMEREINHEITEN TYPEN 1, 2, 4



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		SOURCE
B 14.1.2.3	Distribution/room	B 01
(1)	- apartment type 1, 2 and 4 with 2 distribution panels each flush mounted in walk-in closets	B 02
	- apartment type 3 with a joint flush mounted distribution in ante-room next to entrance door	B 03
	- NCO-rooms type 5 with 1 flush mounted distribution in walk-in closets	B 04
(2)	Apartment distribution panel 1 panel wide, 2-3 row, with an electrical and vertically arranged mechanical division of sections 400/230 V and 208/120 V. Arrangement in corridor wall flush mounted top edge distribution panel) 1.90 above finished floor.	B 05
(3)	Automatic circuit breakers for receptacles and light separately, a joint power circuit for lighting of all rooms, except bathrooms, incl. 230 V smoke detectors in bedrooms, current circuits for receptacles 230 and 120 V in kitchenettes with personal circuit breakers B 16/0.01 A..	B 06
(4)	No series terminals for supply lines and line exits.	B 07
(5)	Additionally for bathrooms in joint distributions of apartment type 4 and in NCO-rooms:	B 08
	- 1 receptacle circuit 230 V with 1-pole personal circuit breaker B 13/0.01 A	B 09
	- 1 receptacle circuit 120 V with 1-pole personal circuit breaker B 13/0.01/A	B 10
	- 1 power circuit with circuit breaker B 10 A for lighting in bathroom with follow-up operation fan - step 2	B 11
	- 1 breaking relay with approach via building timer and/or EMCS, for switching of fans - step 1) (stand-by mode)	B 12
		B 13
		B 14
		B 15

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B 14.1.2.3.1 Heat Dissipation

Fig 14.4

DETERMINATION HEAT DISSIPATION DISTRIBUTION/ROOM 3ROWS
ERMITTLUNG DER VERLUSTLEISTUNG ALLER BETRIEBSMITTEL EINES WOHNRAUMVERTEILERS, 3REIHIG

Operation identification	device	Qty	Type	I _n	I _b	P _{v(n)}	P _{v(B)}	P _{v(ges)}
Circuit breaker 1-pole		5	ULS B 16A	16	8	4,70	1,17	5,90
Circuit breaker 1-pole		1	ULS B 10 A	10	5	2,50	0,62	0,62
FI-switch 1-pole.		1	FIBI 216/10	10	5	10,20	2,55	2,55
Switch relay 1-pole 230V 2VA		1	WES 6/100	16	5	3,40	0,32	0,32
left half of cabinet								9,39
Circuit breaker 1-pole		4	ULS C 16A	16	8	4,7	1,17	4,68
FI-switch 1-pole		1	FIBI 216/10	10	5	10,20	2,55	2,55
right half of the cabinet								7,53
Total heat dissipation								16,62

heat dissipation to be released by radiation from distributors in case of wall mounting with excess temperature of 20 Kk:

Example STRIEBEL+JOHN small distributor:	
UK420 HxWxD 435x335x90 (2-row)	15,0
UK430 HxWxD 560x335x90 (3-row)	19,0

I _n / A	rated current
I _b / A	operation current
P _{v(n)} / W	heat dissipation with rated current
P _{v(B)} / W	heat dissipation with operation current
P _{v(ges)} / W	total heat dissipation

(1)

Proof of observance of limit temperature as per applicable regulations:

VDE 0660
Part 507/4.91
(IEC 890)

(1.2)

Explanations to calculation example:

- Determination of effective power loss P_v in control cabinet system
- The power losses of operation devices installed in control cabinet were taken from the information provided by the manufacturer.

$$P_v = P_N \cdot \left(\frac{I_B}{I_N} \right)^2$$

- The power loss has been reduced acc. to the following formula, as the operation devices are partially being operated with operation current I_b deviating from their rated current I_n:

- A rated load factor of f²=0.5 was considered for receptacle circuits and user outlets according to the number of these outlets where the effective load is not known;
see also **Fig. 14.4**

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SOURCE

(1.3)

- The permissible excess temperature of the air within the distribution system will be:

$$\Delta t_{zul} = t_s - T = 55^{\circ}\text{C} - 35^{\circ}\text{C} = 20 \text{ K.}$$

Radiating power as per the directions of the manufacturer = 19.0 W

Total of effective power loss = 16.6 W

(1.4)

Result:

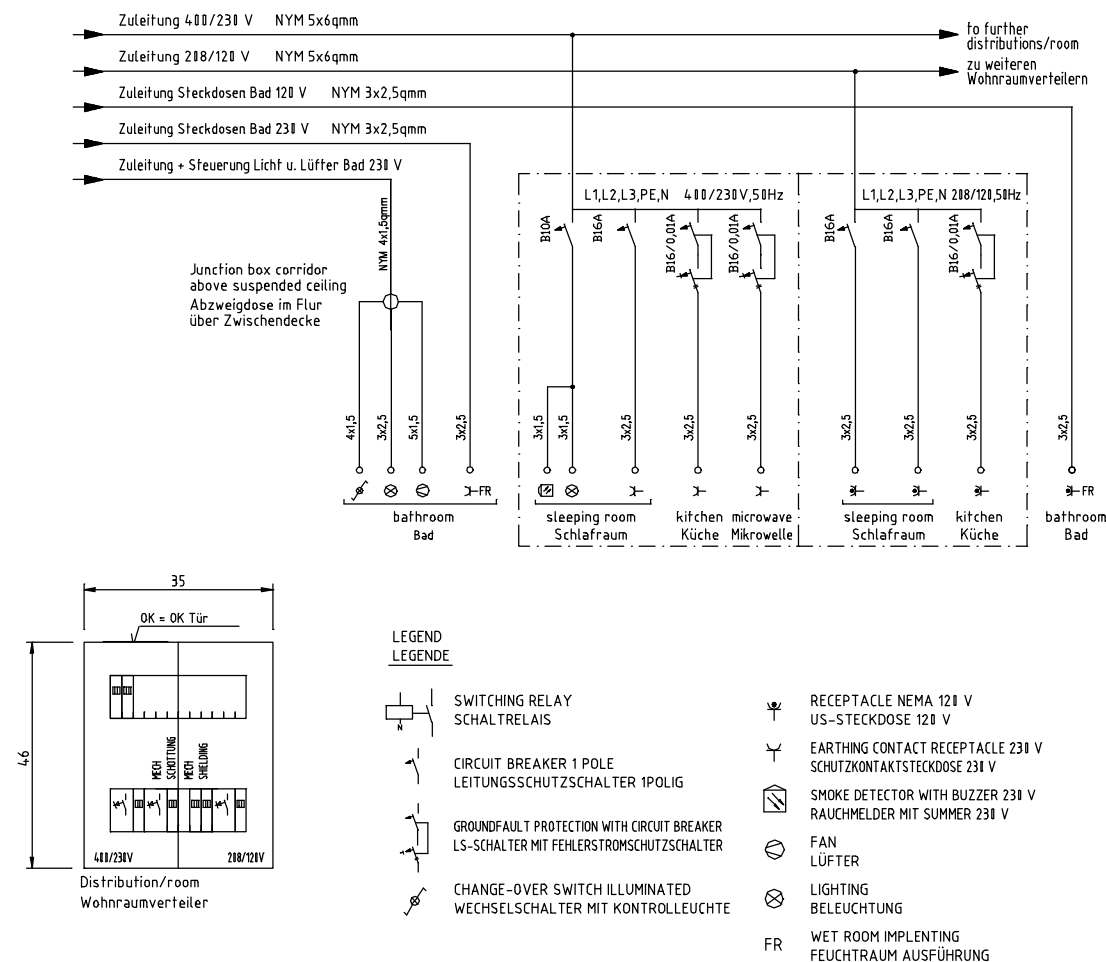
Sufficient dimensioning of the selected distribution panel for radiating of effective power loss via its outside areas. An increase of the power loss is not possible as far as mathematical aspects are concerned. However, it needs to be considered that the upper row will not be occupied in the 3-row distribution panel.

(2)

As ODCSENGR attaches great importance to the fact that distributions/room will be provided as small as possible, distribution doors with ventilation gills as special make of manufacturers can be used, if required.

Fig 14.5

**DISTRIBUTION/ROOM TYPEN 1, 2, 4
WOHNRAUMVERTEILER TYPEN 1, 2, 4**



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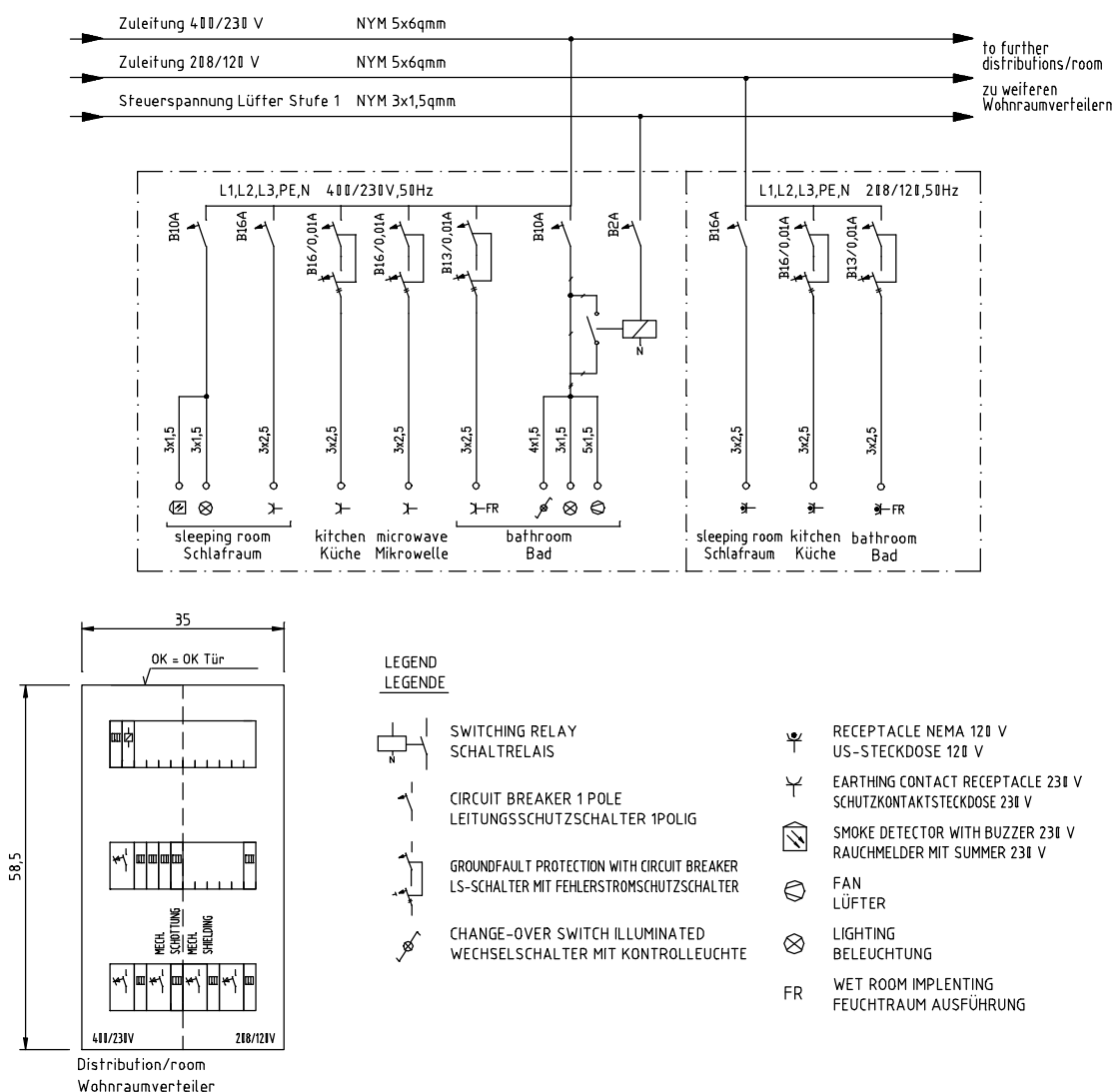
SOURCE

(3)

Attention shall be paid to equal load of individual conductors of the supply cable for apartments, as far as possible. 3 and/or 6 power circuits for the microwave ovens as well as the current circuits for kitchens and refrigerators and for receptacles in living room shall be connected to the 3 phases alternately.

Fig 14.6

DISTRIBUTION/ROOM TYP 3 AND 5 WOHNRAUMVERTEILER TYP 3 UND 5



B 01

B 02

B 03

B 04

B 05

B 06

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		SOURCE
B 14.1.2.4	Selectivity Coordination	B 01
(1)	Fuses shall not be used as far as possible.	B 02
(2)	Miniature circuit breakers, main automatic circuit breakers and circuit breakers shall be of uniform make, as the selectivity between the protective equipment is based of laboratory tests of the manufacturer.	B 03
(3)	The selectivity lists of protective equipment of the manufacturers can be used for determination of selectivity of the electrical system.	B 04
(4)	Sequence of selectivity	B 05
(4.1)	Main connection box, if it remains	B 06
	- existing fuses and/or circuit breakers	B 07
	- new circuit breakers and/or load circuit breaker, if required	B 08
(4.2)	Building distribution panel	B 09
	- compact circuit breaker as building main switch (same as ABB SACE Isomax S or equal)	B 10
	- main automatic circuit breakers, release characteristics E, selective, breaking capacity 25 kA, selectivity class 3 for exits	B 11
	- line protection switch, release characteristic B, breaking capacity 6 kA, selectivity class 3	B 12
(4.3)	Distribution/floor	B 13
	- main automatic circuit breakers, release characteristics E selective, breaking capacity 25 kA, selectivity class 3	B 14
	- circuit breakers, release characteristics B, breaking capacity 6 kA, selectivity class	B 15
(4.4)	Distributions/room	
	- circuit breaker, release characteristics B, breaking capacity 6 kA, selectivity class 3	

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B 14.1.3	CABLES AND WIRES		B 01
B 14.1.3.1	Design		B 02
(1)	The installation shall be with plastic jacket cable NYM, or if required, with plastic cables NYY and/or NYCWY. Utilization of leads will only be possible on leveled ceilings with thin plaster layer upon previous coordination with the Construction Supervision.	VDE 0100 Part 520	B 03
(2)	Installation in concrete, in conduits only, for heavy mechanical duty Fukui's.	DIN 49 018 Part 2	B 04
(3)	Surface-mounted installation exclusively in conduit and/or on cable duct or on cable trays. Conduit for surface-mounted installation shall generally be plastic pipe, where required, aluminum pipe conduits shall be used. Installation in mechanical rooms and in arms rooms in pipe open in spacing clamps. The installation of alarm system in arms room in steel armored conduit closed.		B 05
(4)	All plastic pipes and ducts installed surface mounted shall be free from halogen.		B 06
(5)	The secondary voltage network shall be installed in a sufficient, electrically safe way, separated by spacings or by separating ridge. Risers of secondary voltage and communication systems shall also be conducted separately by separating ridge or spacings.	VDE 0800	B 07
(6)	Cables and wires lead through fire walls and slabs shall be separated with fire protection material F90. The separations shall guarantee a sufficient sound insulation between adjacent rooms. Separations with construction supervisory allowance are required for wall and ceiling passages. A test certificate alone is not sufficient. A permanent marking with identification sign shall be applied to each separation, location shall be included in inspection plan. Further requirements to separations: - the supplementary installation of cables and lines shall be possible with low expenditure - the heat protection agent shall not be subject to crack formation - the efficiency of materials without additional ceiling protection shall not be less due to age - the form and corrosion resistance shall be guaranteed	DIN 4102	B 08
(7)	Installation in fire resistant installation ducts fire rating class I 30 in escape and exit ways in corridors.	DIN 4012 Part 11	B 09
			B 10
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(8) Cable and line guide through stair spaces shall be avoided. If this is not possible, appropriate fire protection measures shall be considered.	B 01
B 14.1.3.2 Supply Cable and Riser Cable	B 02
(1) Individual, appropriately dimensioned supply cables will be led in a star-type way from building distributions to the sub distribution panels. Moreover, single control cables 7 x 1.5 mm ² shall be installed to all distributions/floor and distribution panels of the mechanical systems.	B 03
(2) The following information shall be determined:	B 04
- Supply cable from main connection box and/or connecting point to the main distribution panels (type of cable, installation, max. voltage drop/max. strength of current) TN-C system	B 05
- Supply cable 400/230 V system from main distribution panels to floor sub-panels (type of cable, installation, max. voltage drop, max. strength of current). TN-S system with division of neutral conductor into neutral conductor and grounding conductor.	B 06
- Supply cables from main distribution panels to sprinkler and booster systems shall be provided with cables with function maintenance E90.	B 07
- Supply cable 208/120 V system from main distribution panels to sub-panels (type of cable, installation, max. voltage drop, max. strength of current) TN-S system.	B 08
- Supply cable 400/230 V from floor sub-panels to distributions/room (type of cable, installation, max. voltage drop, max. strength of current) TN-S system.	B 09
- Supply cable 208/120 V system from floor sub-panels to distributions/room (type of cable, installation, max. voltage drop, max, strength of current) TN-S system.	B 10
Strength of current and maximum admissible current of cables see DIN VDE 0100, Part 430 as well as DIN VDE 0298 Part 4.	B 11
(3) Voltage drop	B 12
- The voltage drop in main supply cable, between the terminals of the main connection box and/or building connection point and the main distribution panel shall not exceed 0.5 % based on the nominal voltage 400/230 V.	B 13
- The voltage drop in the supply cables, between the terminals of the main distribution panel and the floor sub-panels and/or the distributions from mechanical shall not exceed 1 %, based on the nominal voltage 400/230 V and/or 208/120 V.	B 14
- The voltage drop in the supply cables, between the terminals of the distributions/floor and the room distribution panels shall not exceed 1 % based on the nominal current 400/230 V and/or 208/120 V.	B 15

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SOURCE

Fig. 14.7

VOLTAGE DROP SUPPLY CABLE SPANNUNGSFALL ZULEITUNGEN

The voltage drop will be determined acc. to DIN VDE 0100 Part 520, AVBElt and DIN 18015 Part 1

Cross section	Fuse protection	Voltage	Voltage drop	Cable length max.
35 mm ²	100 A	400 V	1 %	45,3 m
35 mm ²	80 A	400 V	1 %	56,6 m
25 mm ²	80 A	400 V	1 %	40,5 m
25 mm ²	63 A	400 V	1 %	51,4 m
16 mm ²	63 A	400 V	1 %	32,9 m
10 mm ²	50 A	400 V	1 %	25,9 m
6 mm ²	32 A	400 V	1 %	24,3 m
25 mm ²	80 A	208 V	1 %	21,0 m
25 mm ²	63 A	208 V	1 %	26,7 m
16 mm ²	63 A	208 V	1 %	17,1 m
10 mm ²	50 A	208 V	1 %	13,5 m
10 mm ²	32 A	208 V	1 %	21,0 m
6 mm ²	32 A	208 V	1 %	12,6 m

Fig. 14.8

POWER NEED APARTMENTS LEISTUNGSERMITTLUNG FÜR ZIMMEREINHEITEN

Power need for 1 apartment unit 1+1 (P _{gl.ben.})					
			P _{ges}	Gf.	
230 V	26x receptacles	à 180 VA =	4.680 VA	x 0,5 =	2.340 VA
	2x microwave ovens	à 1.400 VA =	2.800 VA	x 1,0 =	2.800 VA
	2x refrigerators	à 200 VA =	400 VA	x 1,0 =	400 VA
	Lighting (type 1)	à 500 VA =	200 VA	x 1,0 =	500 VA
			Ges.		6.040 VA
				x 0,5	3.000 VA
<hr/>					
120 V	20x receptacles	à 180 VA =	3.600 VA	x 0,5 =	1.800 VA
<hr/>					
3 apartment units					
400 V/3 x 3.000 VA x 0,7			= 6.300 VA (at 230 V)		
<p>E.g. each one 1 line NYM 5 x 6 mm² with 3-pole main fuse circuit breaker with release characteristic E selective 32 A can be planned as supply cable to the apartment distribution panels for both networks.</p> <p>See Fig. 14.9 and/or 14.10</p>					

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

SOURCE

Fig. 14.9

SAMPLE FEED-IN APARTMENTS TYPEN 1, 2, 4
BEISPIEL EINSPEISUNG ZIMMERINHEITEN TYPEN 1, 2, 4

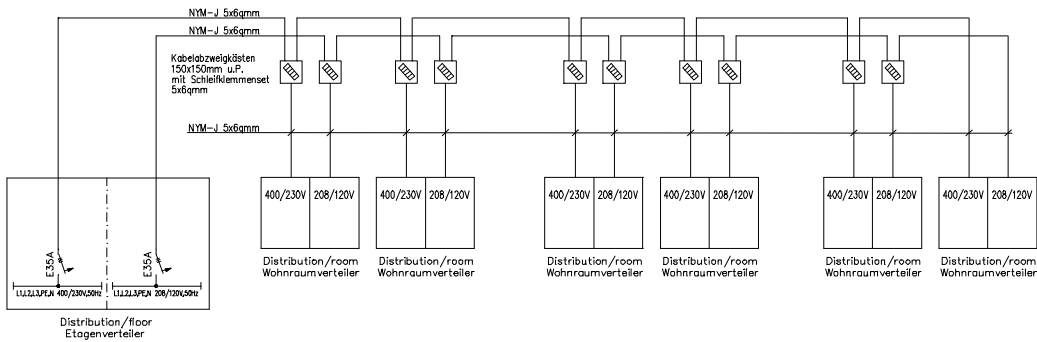
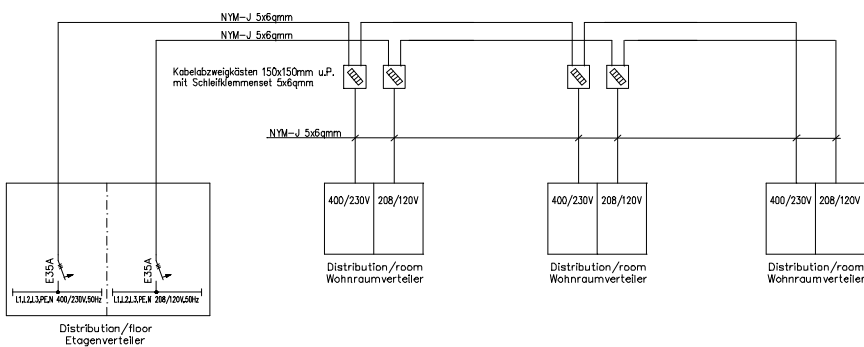


Fig. 14.10

SAMPLE FEED-IN APARTMENTS TYP 3 AND 5
BEISPIEL EINSPEISUNG ZIMMERINHEITEN TYP 3 UND 5



B 14.1.3.3 Installation Cables and Wires

(1) Type of Installation

(1.1) Basement

Wall area

- Office rooms and/or storage room
in bricked corridors and existing concrete walls generally flush mounted,
in new concrete walls lines in protective pipe in formwork
- Mechanical rooms
surface-mounted in pipe, in cable duct, on cable trays
- Arms room
surface-mounted in pipe in open installation
alarm system surface mounted in closed steel armored conduit installation

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
- Corridors and staircases flush-mounted in concrete walls to be provided new in pipe in formwork	B 01
<u>Ceiling area</u>	B 02
- Office rooms and/or storage rooms above suspended ceilings on cable supports or in cable duct with small number of cables, with collective fastening to unfinished ceiling at rooms without suspended ceilings on cable courses, stub cables in orderly installed protective pipes surface mounted	B 03
- Mechanical room surface-mounted in pipe, on cable trays, in cable ducts	B 04
- Arms room surface-mounted in pipe alarm system in closed steel armored conduit installation surface mounted	B 05
- Staircase flush-mounted also in concrete chases in ceilings to be concreted new in formwork in pipe	B 06
- Corridor cable ducts with F30 covering or pipes in formwork shall be installed for crossing of corridors.	B 07
The power circuit lines and communication lines for the basement will be led parallel to the corridor on cable trays within the rooms.	B 08
No foreign cables or lines shall be led through the arms rooms.	B 09
(1.2) 1st floor and 2nd floor	B 10
<u>Wall area</u>	
- All rooms flush-mounted or in concrete	B 11
<u>Ceiling area</u>	
- Inside rooms flush-mounted, flat webbed house wire only where absolutely required, at new concrete ceilings in protective pipe in formwork above suspended ceilings, on cable tray and/or with collective fastening to unfinished ceiling	B 12
- Corridors above suspended ceilings in escape and rescue routes, in installation ducts of fire rating class I30,	B 13
	B 14
	B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

				SOURCE
(1.3)				B 01
Attic				
if construction differs from main floor				
<u>Wall area</u>				B 02
- Corridors and all inside rooms				
flush-mounted or in hollow spaces of stud walls				
<u>Ceiling area</u>				B 03
- Corridors and all rooms				
above F60 ceiling on cable tray, cable supports and/or with collective				
fastening as far as installation in upper attic is possible				
where no installation in upper attic is possible, in I30 ducts below				B 04
suspended				
ceiling				
(1.4)				B 05
Upper attic				
- entire area				
open pipe installation, surface-mounted				B 06
(2)				
Voltage Drop				
- The total voltage drop shall not exceed 3 % based on the respective nominal				
voltage in secondary voltage installations within the building.				B 07
Fig. 14.11				
TABLE VOLTAGE DROP CABLES				B 08
TABELLE SPANNUNGSFALL KABEL UND LEITUNGEN				
Cross section	Fuse protection	Voltage	Voltage drop	Cable lengths max.
1,5 mm ²	10 A	230 V	2 %	19,3 m
1,5 mm ²	13 A	230 V	2 %	14,9 m
1,5 mm ²	16 A	230 V	2 %	12,1 m
2,5 mm ²	16 A	230 V	2 %	20,1 m
2,5 mm ²	20 A	230 V	2 %	16,1 m
4 mm ²	25 A	230 V	2 %	20,6 m
6 mm ²	32 A	230 V	2 %	24,2 m
2,5 mm ²	16 A	400 V	2 %	40,5 m
4 mm ²	16 A	400 V	2 %	64,7 m
4 mm ²	25 A	400 V	2 %	41,4 m
1,5 mm ²	10 A	120 V	2 %	10,1 m
1,5 mm ²	13 A	120 V	2 %	7,8 m
1,5 mm ²	16 A	120 V	2 %	6,3 m
2,5 mm ²	16 A	120 V	2 %	10,5 m
4 mm ²	16 A	120 V	2 %	16,8 m
4 mm ²	20 A	120 V	2 %	13,4 m
6 mm ²	20 A	120 V	2 %	20,2 m
6 mm ²	32 A	120 V	2 %	12,6 m
1,5 mm ²	10 A	230 V	3 %	29,0 m
1,5 mm ²	13 A	230 V	3 %	22,3 m
1,5 mm ²	16 A	230 V	3 %	18,1 m
2,5 mm ²	16 A	230 V	3 %	30,2 m
4 mm ²	25 A	230 V	3 %	30,9 m
6 mm ²	32 A	230 V	3 %	36,2 m
				B 10
				B 11
				B 12
				B 13
				B 14
				B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

The installed power (P_{inst}) of light fixtures plus 50 % can be taken as a basis for lighting circuits for determination of the voltage drop.	SOURCE
	B 01
	B 02
	B 03
	B 04
	B 05
	B 06
	B 07
	B 08
	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
B 14.1.4	EQUIPMENT FOR INSTALLATIONS		B 01
(1)	The standard program of equipment from one manufacturer, heavy-duty type, color white, shall generally be used according to previous coordination with the architect and the authorized DPW.	VDE 0100 Part 550	B 02
Switch for installations	10 A/250 V/50 Hz	DIN 49 200	B 03
230 V-receptacles	2-pole + E/16 A/250 V, 50 Hz Schuko and/or 2P + E/32 A/250 V, CEE-type	DIN 49 440 VDE 0620 DIN 49 462/63	B 04
120 V-receptacles/U.S. standard	2-pole + E/20 A/125 V, 50 Hz	NEMA 5-20 R	
Power receptacle	3P + N + E E/16 A/400 V, CEE-type	DIN 49 462/63	B 05
(2)	Grounded receptacles with separated middle and protective conductor contacts. Flush-mounted receptacles for threaded fastening of equipment, no claw fastening.		B 06
(3)	Several devices arranged next to or below each other, of same power type, shall be performed as combinations.		B 07
(4)	All surface-mounted equipment as wet-room type with PVC-inlets.		B 08
(5)	Junction boxes, surface-mounted, with safely attached, unmistakable and permanently well legible identification of power circuits.		B 09
	Installation of junction boxes shall be avoided especially in living rooms and wet rooms.		
(6)	Each room shall be equipped with not less than 1 switch, larger rooms shall have several switch groups to facilitate area-wise switching of lighting.		B 10
	Control buttons for switching of lighting in corridors and staircases.		B 11
(7)	In rooms with tiled walls, the arrangement of equipment shall generally be in the middle of the tile.		B 12
(8)	Flush-mounted equipment in laundry and in bathrooms in wet room make, receptacles with hinged covers.		B 13
			B 14
			B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
B 14.1.5	CONNECTIONS	B 01
(1)	Connections of lifting system and of sprinkler pump, when existing.	B 02
(2)	Connections of key-card-systems at all outside doors.	B 03
(3)	Connection dehumidification equipment arms room.	B 04
(4)	Installation of wires in mechanical centers to control cabinets and from control cabinets to operation devices of the mechanical system according to the directions of the special designer. All connections will be accomplished by the mechanical firms.	B 05
(5)	Ventilator/room with or without follow-up relay, according to the information of the mechanical - delivery, installation and connection incl. follow-up relay by mechanical. Supply cable via lighting circuit - installation by electrical	B 06
	in - janitor's closets - latrines, basement and attic - mechanical and electrical rooms - storage bin rooms without windows - office rooms - laundry	B 07
		B 08
(6)	2 step fan follow-up relay for second step - delivery, installation and connection of both steps by mechanical - approach of first step via electrical	B 09
	- in bathrooms of apartments	B 10
(7)	Ventilator/room with follow-up relay - delivery, installation and connection by mechanical - supply cable via lighting circuit by electrical	B 11
	In addition to that, a second long-term follow-up control in small distribution panel casing flush-mounted on the door, corridor side, with 1 electronic timer relay 1-pole, switch-off delayed, 10 - 100 mm, as well as 1 push button - delivery, installation and connection by electrical	B 12
	- in mud room	B 13
		B 14
		B 15

Fig. 14.12

CONTROL FOR VENTILATOR/ROOM MUD ROOM

STEUERUNG RAUMLÜFTER SCHMUTZRAUM

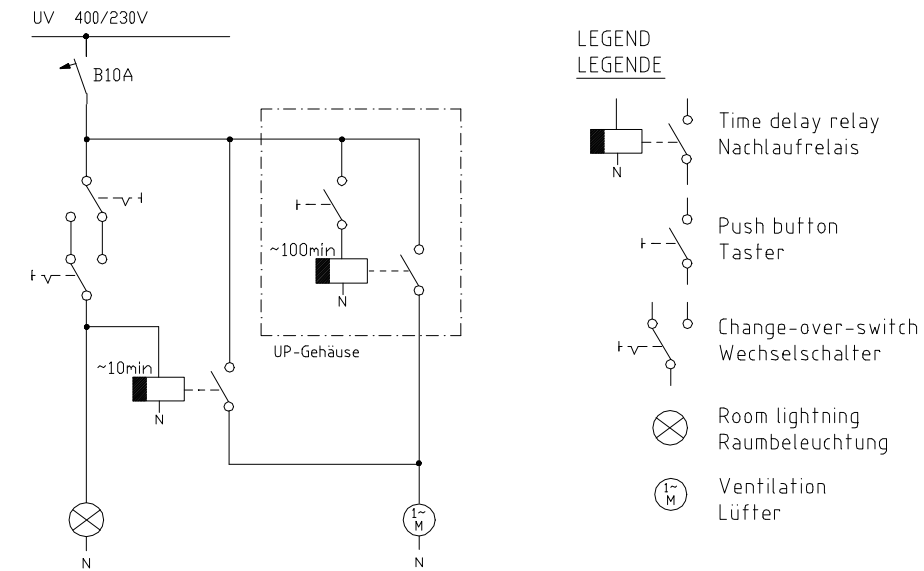


Fig. 14.13

TABLE CONSUMER/EQUIPMENT DATA

TABELLE VERBRAUCHER/GERÄTEDATEN

Consumer	Capacity	Simult.-factor	separate current circuit
Schuko receptacle 230V	180 VA	0,3	max 1440 VA
NEMA-receptacle 120 V	180 VA	0,3	max 1440 VA
Kitchen vapor escape hood	100 VA	0,6	no
Kitchen refrigerator	200 VA	1,0	yes
Microwave oven	1400 VA	0,4	yes
Kitchen range EUR	9100 VA	0,6	yes
Washing machine EUR	1250 VA	0,6	yes
Dryer EUR	2200 VA	0,6	yes
Ice machine with water softening	acc. to direction	1,0	yes

The indicated values of devices shall be coordinated with responsible DPW and/or erecting firm.

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
B 14.1.6	GENERAL LIGHTING	NFPA VDE 0100 Part 559 VDE 0128 DIN 5035 DIN 5044	B 01
B 14.1.6.1	Quality Characteristics		B 02
(1)	All quality characteristics of the lighting system such as light intensity, quality and light color, shall be in conformance with applicable standards and guidelines.		B 03
(2)	Sheet steel parts of light fixture bodies shall be primed, painted and baked-on, provided with heavy-duty grounding screw, all connecting elements and connections shall be heat-resistant and factory-finished. Plastic covers and plastic elements of light fixtures shall be treated antistatic.		B 04
(3)	Light fixtures for long panel and compact light fixtures with analog electronic ballasts, no digital electronic ballasts . Light media for long panel light fixtures 26 mm diameter, light flux 1350/3350/5200 lm. Light color: warm tone.		B 05
			B 06
B 14.1.6.2	Types of Light Fixtures		B 07
(1)	It is being suggested to indicate letter types, according to the following list, in specifications and drawings for a better overview over the individual types of light fixtures.		B 08
Fig. 14.14			B 09
DESIGNATION OF LUMINAIRES LEUCHTENBEZEICHNUNG			B 10
Type	Light fixture		B 11
A	Surface-mounted light fixture with aluminum mirror louver 2xL36W/IP20		B 12
B	Recess-mounted light fixture with dark light mirror louver 2xL36W/IP20		
C	Recess-mounted light fixture with dark light mirror louver 3xTC24Q/IP20		
D	Surface-mounted light fixture with white aluminum louver 1xL36W/IP20		B 13
E	Surface-mounted light fixture with prismatic cover 1xL36W/IP50		
F	Surface-mounted light fixture with prismatic cover 2xL36W/IP50		
G	Surface-mounted light fixture with prismatic cover 2xTC11W/IP50	B 14	
H	Surface-mounted light fixture with prismatic cover 1xL36W/IP54		
I	Recess-mounted light fixture with prismatic cover 2xL36W/IP54		
J	Recess-mounted light fixture with prismatic cover 1xL36W/IP54	B 15	
K	Recess-mounted light fixture with white aluminum louver 1 xL36W/IP20		
L	Surface-mounted light fixture with white aluminum louver 2xL36W/IP20		
M	Panel-type recess-mounted light fixture with prismatic cover 1xL36W/IP54	B 15	
N	Supporting profile insert light fixture with lamella louver 1xL36W/IP20		
O	Panel-type recess-mounted light fixture with prismatic cover 1xL18W/IP20		
P	Wall-mounted surface light fixture with opal glass cover 1xTC18W/IP40	B 15	
P1	Surface-mounted light fixture with opal glass cover 1xL36W/IP20		
Q	Wall-mounted surface light fixture with plastic cover 2xTC-S11W/IP65		
R	Die-cast aluminum oval-type light fixture with glass and protective grille 1x100W/IP40	B 15	

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
S	EXIT light fixture for wall mounting	B 01
T	EXIT light fixture for wall-mounted cable suspension installation	
U	EXIT light fixture for ceiling mounting	
V to Z	free for individual and exterior light fixtures	B 02
The following light fixture types are proposed:		
<u>Built-in light fixtures</u>		B 03
Bedrooms:	Surface-mounted light fixture with aluminum mirror louver, 2x L 36 W, type of protection IP 20 TRILUX 5402N RST/36 or equal - Type A –	B 04
Closet rooms:	Surface-mounted light fixture with prism cover 2x TC 11 W, type of protection IP 50 TRILUX 3452 7/TC 11-type G	B 05
Bathroom apartment type 1+1	Recess-mounted light fixture with prismatic cover, type of protection IP 54, 1x L356 W TRILUX 7202 PS/1x36 or equal - Type J -	B 06
Bathroom NCO apartment type	Recess-mounted light fixture with prismatic cover, type of protection IP 54, 2x L36 W TRILUX 7202 P/36 or equal - Type I -	B 07
Corridors on 1 st floor and top floors	Recess-mounted light fixture 1x L 36 W, with white aluminum louver, type of protection IP 20 TRILUX 3601RW/36 or equal - Type K -	B 08
Staircases with all adjacent corridors and entrance areas, kitchens	Surface-mounted light fixture 1x/2x L 36 W with white aluminum louver, type of protection IP 20 TRILUX 5081/2W-RW/36 or equal - Type D/L -	B 09
Storage bin rooms/luggage soldiers, joint kitchenettes in the living units, janitor's closet arms room, attic space above attic	Surface-mounted light fixture with prismatic cover 1x/2x L36 W, type of protection IP 50, TRILUX 3451/3452 PN/36 or equal - Type E/F -	B 10
Latrines Women and Men with ante-room	Panel-type recess-mounted light fixture with prismatic cover, 1x L36 W, type of protection IP 54, wet room TRILUX 4401 PF/36 or equal - type M – and/or 1xL18W, type of protection IP 54, wet room TRILUX 4401 PF/18 or equal – type O	B 11
Latrines above lavatory, bathroom above lavatory (if there is no mirror cabinet)	Mirror light fixture 1x TC 18/36 W with opal glass cover, type of protection IP 40 TRILUX 6641/TC18/36 or equal - type P/P1 -	B 12
Shower rooms in areas	Wall-mounted surface light fixture with clear plastic cover, 2x TC 11 W, type of protection IP 65 TRILUX 7112/TC S11W or equal - type Q -	B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
Mechanical rooms, mud room, laundry	Surface-mounted light fixture with prismatic cover, 1x L 36 W, type of protection IP 54, wet room TRILUX 7131 P 36 or equal - type H -		B 01
Game room	Recess-mounted light fixture 3x TC 24 W with dark light-mirror louver, type of protection IP 20 TRILUX 3653 RPH/3xTC 36W or equal - type C -		B 02
Office and/or storage rooms	Recess-mounted light fixture with dark light mirror louver, 2x L 36 W, type of protection IP 20 TRILUX 3602 RPH/36 or equal - type B -		B 03
Corridors in basement (parallel to pipelines of mechanical)	Supporting profile insert light fixture with lamella louver, 1x L 36 W, type of protection IP 20 TRILUX 7691 RW/36 or equal - type N -		B 04
Corridor in front of arms room, between door and service window	Die-cast aluminum oval-type light fixture 1x 100 W, glass cover with protective grille, type of protection IP 40 RZB 50 702 004 Q or equal - type R -		B 05
<u>Exterior light fixtures</u>			B 06
Exterior light fixtures at main entrances	Surface-mounted light fixture 1x HQL 1x 80 W, opal glass cover with louver, type of protection IP 55 BEGA 2782 or equal - type V -		B 07
Exterior light fixtures at side entrances	Surface-mounted light fixture 1x TC-18 W, opal glass cover with louver, type of protection IP 55 BEGA 2774 or equal - type W -		B 08
The exterior light fixtures can be selected in each individual case depending on the existing exterior lighting and shall be coordinated with the architect and the authorized DPW prior to design.			B 09
(3)			B 10
Interior light mixtures of makes TRILUX, REGIOLUX, KANDEM or SITECO – as listed in following table – can be selected, however, with exception of types I, J or O, a uniform make shall be always selected. The suggestions shall be coordinated with the responsible DPW in the course of concept design.			B 11
			B 12
			B 13
			B 14
			B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE

Fig. 14.15

**TABLE LIGHTING MANUFACTURER DATA AND TYPES
TABELLE LEUCHTENFABRIKATE UND TYPEN**

A – Surface mounted grid light fixture

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	5402N RST/36	LRS 2/36EVG	AR54 2x36/EVG	5LP2167-2C
Equipment	2xL36W	2xL36W	2xL36W	2xL36W
Make	Aluminum mirror grid	Aluminum mirror grid	Aluminum mirror grid	Aluminum profile grid
Protect. type	IP20	IP20	IP20	IP20

B – Recess-mounted light fixture with mirror grid

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	3602 RPH/36	RSED 2/36 EVG	ER47 2x36/EVG	5LP1127-2C
Equipment	2xL36W	2xL36W	2xL36W	2xL36W
Make	Darklight grid	Darklight grid	Paraboloidal mirror reflector	BAP60 mirror reflector
Protect. type	IP20	IP20	IP20	IP20

C – Recess-mounted grid light fixture

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	3604 RPH 3xTC36	KUED 3/36 EVG	ER46K3x24/EVG	5LP1127-4A
Equipment	3xTC36W	3xTC-L36W	3xTC-L24W	4x18W
Make	Darklight grid	Darklight grid	Aluminum paraboloidal mirror	Darklight grid
Protect. type	IP20	IP20	IP20	IP20

D – Surface mounted grid light fixture

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	5081 W-RW/36	RMAC 1/36 EVG	AR511x36/EVG	5LP2177-1C
Equipment	1xL36W	1xL36W	1xL36W	1xL36W
Make	Alu grid white	Sheet steel grid white	Alu grid white	Alu grid white
Protect. type	IP20	IP20	IP20	IP20

E – Surface mounted grid tub light fixture

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	3451 PN/36	KLPS 1/36 EVG	AP25 1x36/EVG	5LJ2357-1C
Equipment	1xL36W	1xL36W	1xL36W	1xL36W
Make	Prism tub	Prism tub	Prism tub	Prism tub
Protect. type	IP50	IP50	IP50	IP50

F – Surface mounted tub light fixture

Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO
Type	3452 PN/36	KLPS 2/36 EVG	AP25 2x36/EVG	5LJ2357-2C1
Equipment	2xL36W	2xL36W	2xL36W	2xL36W
Make	Prism tub	Prism tub	Prism tub	Prism tub
Protect. type	IP50	IP50	IP50	IP50

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

					SOURCE
G – Surface mounted tub light fixture					B 01
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 02
Type	3452 P/TC11	PDAP 2/18 EVG	FW50K 2x18/EVG	5LJ 2357-2AX1	
Equipment	2xTC-S11W	2xL18W	2xTC-L18W	2xL18W	
Make	Prims tub	Prims tub	Opal tub	Prism tub	
Protect. type	IP50	IP40	IP54	IP50	
H – Wet room tub surface mounted light fixture					B 03
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 04
Type	7131/P36	PFP 1/36 (EVG?)	FP45 1x36/EVG	5LS3617-1C	
Equipment	1xL36W	1xL36W	1xL36W	1xL36W	
Make	Wet room prism tub	Wet room prism tub	Wet room prism tub	Opal tub	
Protect. type	IP54	IP54	IP54	IP54	
I – Wet room recess-mounted light fixture					B 05
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 06
Type	7202 P/36	PLPESA2/36 EVG	-	-	
Equipment	2xL36W	2xL36W	-	-	
Make	Prism covering	Prism tub	-	-	
Protect. type	IP54	Wet room	-	-	
J – Recess-mounted					B 07
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 08
Type	7202 PS/1x36	PLPESA 1/36 EVG	-	-	
Equipment	1xL36W	1xL36W	-	-	
Make	Prism covering	Prism tub	-	-	
Protect. type	IP54	Wet room	-	-	
K – Recess-mounted grid light fixture					B 09
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 10
Type	3601 RW/36	RME 1/36 EVG	ER41 1x36/EVG	5LP1177-1C	
Equipment	1xL36W	1xL36W	1xL36W	1xL36W	
Make	Alu grid white	Sheet steel grid white	Metal grid white	Alu grid white	
Protect. type	IP20	IP20	IP20	IP20	
L – Surface mounted grid light fixture					B 11
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 12
Type	5082 RW/36	RMAC 2/36 EVG	AR51 2x36/EVG	5LP2177-5C	
Equipment	2xL36W	2xL36W	2xL36W	2xL36W	
Make	Alu grid white	Sheet steel grid white	Alu grid white	Alu grid white	
Protect. type	IP20	IP20	IP20	IP20	
					B 13
					B 14
					B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE					
M – Panel recess-mounted light fixture					B 01
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 02
Type	4401 PF/36	PLPFR 1xL36 EVG	-	5LS3407-1C	
Equipment	1xL36W	1xL36W	-	1xL36W	
Make	Prism tub	Prism tub	-	Opal tub	
Protect. type	IP54	IP54	-	IP54	
N – Lamella grid light fixture with support profile					B 03
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 04
Type	7691/36 +07691G/36 +07691RW variable + support profile	SMG 1/36 EVG +SMC+SMLRC +support rail	LKSV60 1x36W/EVG +RD62+LW 62 +SV65 + support rail	5LJ1707-1C+ 5LJ1401-2CB+ 5LE7801-2CR +support rail	
Equipment	1xL36W	1xL36W	1xL36W	1xL36W	
Make	Sheet steel reflector and lamellas white	Sheet steel white	Sheet steel white	Sheet steel white	
Protect. type	IP20	IP20	IP20	IP20	
O – Panel recess-mounted light fixtures					B 05
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 06
Type	4401 PF/18	PLPFR 1/18 EVG	-	-	
Equipment	1xL18W	1xL18W	-	-	
Make	Prism tub	Prism tub	-	-	
Protect. type	IP 54	IP 54	-	-	
P – Surface mounted tub light fixture					B 07
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 08
Type	6641/18	KDAW 1/18 EVG	AW25 1x18/EVG	5LJ2347-1A	
Equipment	1xL18W	1xL18W	1xL18W	1xL18W	
Make	Opal tub	Opal tub	Opal tub	Opal tub	
Protect. type	IP20	IP40	IP40	IP50	
P1 – Surface mounted tub light fixture					B 09
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 10
Type	6641/36W	KDAW 1/36 EVG	AW25 1x36/EVG	5LJ2347-1C	
Equipment	1xL36W	1xL36W	1xL36W	1xL36W	
Make	Opal tub	Opal tub	Opal tub	Opal tub	
Protect. type	IP20	IP40	IP40	IP50	
Q – Surface mounted wet room light fixture					B 11
Manufacturer	TRILUX	REGIOLUX	KANDEM	SITECO	B 12
Type	7142 PC/TC11	WQL 2/185EVG	FK40K 2x18/EVG	5LS2347-2TR	
Equipment	2xTC-S11	2xTC-L18W	2xTC-L18W	2xTC-L18W	
Make	Polyester tub	Polycarbonate tub	Synthetic tub	Opal tub	
Protect. type	IP65	IP65	IP65	IP65	
					B 13
					B 14
					B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

				SOURCE	
B 14.1.6.3 Recommended Lighting Intensities					B 01
(1) Computer-assisted calculation data of lighting intensity shall be provided for all types of rooms.					B 02
Fig. 14.16					B 03
RECOMMENDED LIGHTING INTENSITIES EMPFOHLENE BELEUCHTUNGSSTÄRKEN					B 04
Function areas	Foot-Candles	Lux	ES-Tables	DIN 5053	B 05
Storage bin rooms/luggage soldiers	20	215			B 06
Bathroom	22	240			B 07
Office and/or storage rooms	50	538			B 08
Building hallways/corridors	16	172			B 09
Kitchens	30	323			B 10
Janitor's closets	20	215			B 11
Bedrooms	20	215			B 12
Mud rooms	20	215			B 13
Game room	50	538			B 14
Mechanical rooms	20	215			B 15
Kitchenettes	30	323			
Latrines	30	323			
Stairwells	20	215			
Arms room	50	538			
Laundry rooms	30	323			
Way and parking area lighting	0,5	5		DIN 5044	
B 14.1.7 SECURITY LIGHTING				U.S. NFC 101 Life Safety Code DIN VDE 0108 DIN VDE 5035 Part 5	B 09
(1) An average lighting intensity of $E_n=10.76$ lux (1 ft candle) with a degree of simultaneity of 40:1 on floor height (20 cm above finished floor) shall be existing along escape routes.					B 10
(2) The entire required lighting shall be arranged in such a way that the failure of an individual light fixture will not result in one area of an escape route becoming completely dark.					B 11
(3) Security lighting shall be alternately distributed to two independent overcurrent protection installations (power circuits) in every separate escape route section.					B 12
(4) The emergency power supply of security lighting shall be dimensioned for supply of the entire installed capacity of the system for a network failure period of not less than 90 minutes.					B 13
					B 14
					B 15

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		SOURCE	
B 14.1.7.1	Security Lighting Systems		B 01
(1)	Installation of security lighting can be optionally based upon the single battery, or the central battery system.		B 02
	Different requirements for execution of the systems as well as accommodation of equipment and cable routing shall be observed. These, again, result in different costs for the security lighting system.		B 03
(2)	Investigations and cost comparisons revealed the following tendency:		B 04
	- Application of single battery system as compared to the group and central battery system is more economical for smaller and medium facilities. (max. 80 light fixtures)		B 05
	- Application of central battery system is generally more economical only for larger facilities.		B 06
	This tendency can be observed also, if costs for battery changes are also considered, whereby a use period of 15 years is used as basis for the security lighting.		B 07
	Furthermore, the installation and construction costs for central battery system such as E30-wiring, separate battery rooms shall also be considered for individual determination, as well as the installation cost for battery changes and increased costs for disposal of nickel/cadmium batteries for the single battery system.		B 08
	The most economical security lighting system must be proposed in each individual case.		B 09
	However, it has to be taken into consideration that the single batter system, due to the redundant arrangement of the supply units, involves an additional safety of the emergency lighting function, which will not be guaranteed to this extent by the central battery system. The failure of the central battery, which cannot be entirely excluded yet, or mechanical damages of the control and monitoring unit or main cable routes of security lighting will inevitably lead to a failure of the entire system.		B 10
	As a matter of principle, the type of the system shall be coordinated with the authorized DPW in advance.		B 11
(3)	<u>Single battery system</u>	NFPA VDE 0108/ /6.4.1	B 12
(3.1)	- Escape sign light fixtures for 1x 8 W T16-Lp as single battery light fixtures in stand-by mode, operating time 90 min, with connection at check-control-bus panel	VDE 0108/ /6.2.1.1 DIN 5035	B 13
(3.2)	- Some of the light fixtures of corridor and staircase lighting and 1 each light fixture at main entrances, outside, in stand-by mode .	VDE 0108/ 6.2.1.2 DIN 5035	B 14
			B 15

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(3.3)

- In case of power failure and undervoltage, light fixtures shall be supplied by single and/or double security light supply units with an operating time of not less than 90 min, with connection to check-control-bus panel.

(3.4)

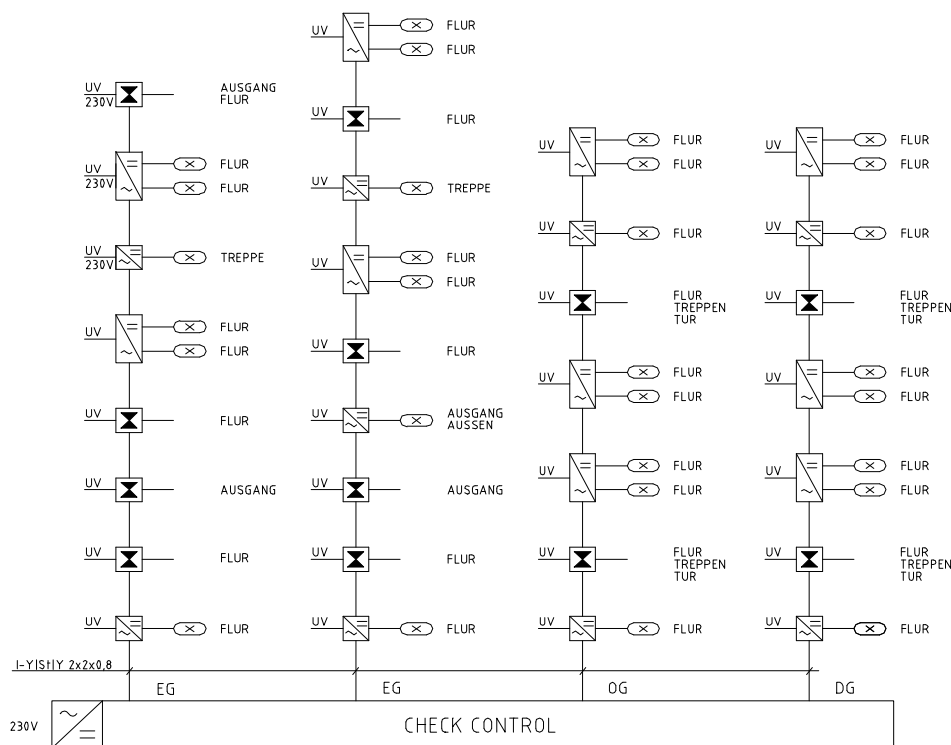
- Monitoring of security lighting via central control panel, such as make PRÄZISA-Check-Control or equal, with independent monitoring circuits each for max. 120 security light fixtures or supply units, with single monitoring of light fixture, inverted rectifier, charging fault and accu-charge, performance at intervals of ? 5 min, weekly automatic functional test with internal back-up of data and printer interface for recording of data with selective display of fault.

(3.5)

Installation of wires will be performed with plastic jacket cables as far as no separate fire section is crossed between the emergency current device and light fixture. Cables with function maintenance E30 shall be installed partially in this case.

Fig. 14.17

SAMPLE SECURITY LIGHTING- INDIVIDUAL BATTERY SYSTEM BEISPIELSSICHERHEITSBELEUCHTUNG - EINZELBATTERIESYSTEM



LEGEND LEGENDE

- LUMINAIRE
LEUCHTE
- SECURITY LUMINAR "EXIT"
EINZELBATTERIE - HINWEISLEUCHTE
- EMERGENCY POWER SUPPLY FOR 1 LAMP
NOTLICHTVERSORGUNG FÜR 1 LEUCHTE
- EMERGENCY POWER SUPPLY FOR 2 LAMPS
NOTLICHTVERSORGUNG FÜR 2 LEUCHTEN

AUSGANG - EXIT
FLUR - CORRIDOR

TREPPEN - STAIRCASE
TÜR - DOOR

SOURCE

B 01

B 02

VDE 0108/
6.4.3.10

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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	SOURCE	
(4) <u>Central battery system</u>	NFPA VDE 0108/ /6.4.3 VBG 4	B 01
(4.1) Central station in separate electronic and battery cabinets, equipped with: - charging modules - batteries for 1.5 hours operation - change-over devices and alarm devices - control and monitoring device - mains monitoring device, 3-phase - light switch setting inquiry modules - light fixture output circuit groups Accommodation of central station and/or battery cabinets in separate ventilated electric operation and/or battery room		B 02
		B 03
		B 04
(4.2) - Escape sign light fixture for 1x 8 W T 16-Lp with EVG, without battery, for connection at central battery systems in stand-by mode with collective monitoring.	VDE 0108/ /Part 1 VDE 0510 /Part 2 ELT. Bau VO VDE 0108/ 6.2.1.1 DIN 5035	B 05
		B 06
(4.3) - Some of the light fixtures of corridor and staircase lighting or separate light fixtures in permanent switching shall be used for the security lighting in escape routes. Single monitoring of light fixtures with collective monitoring without additional monitoring module. (no selective fault alarm)		B 07
		B 08
(4.4) Check control system such as PRÄZISA-Kombi Control-Z, computer- controlled, or equal, for automatic testing of security lighting with:	VDE 0108/ 6.4.3.10	B 09
Test device for: - Monitoring of charge at intervals of < 5 min. - Automatic execution of daily 5-minute functional tests and annual 40-/120-minute operation tests - Display or print of test results of all functional tests. (Mains/Battery/Charging Equipment/Light Fixture Circuit)		B 10
Information program for: - Automatic alarm of faults through speech and text display giving type of fault and freely programmable fault service (name/telephone) - Selective display or print of faults (Mains/Battery/Charging Equipment/Light Fixture Circuit/Bus-line)		B 11
		B 12
(4.5) The cable network will be accomplished with cable systems with function maintenance E30 according to DIN 4102 Part 12. Plastic jacket cable without function maintenance can be installed within one fire section.	DIN 4102 T 12	B 13
		B 14
		B 15

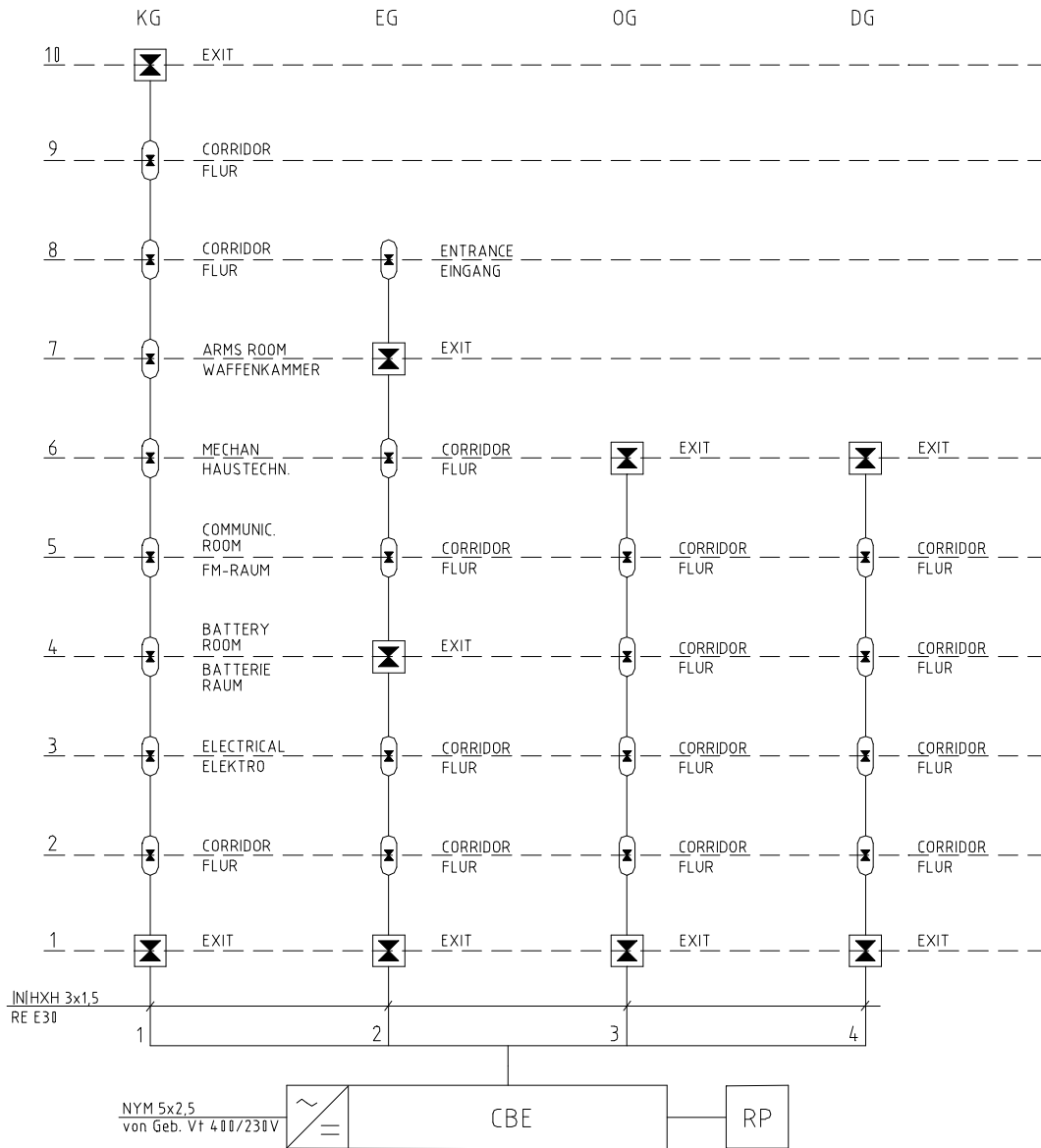
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

SOURCE

Fig. 14.18

SAMPLE SECURITY LIGHTING- CENTRAL BATTERY SYSTEM BEISPIEL SICHERHEITSBELEUCHTUNG -ZENTRALBATTERIESYSTEM



LEGEND LEGENDE

-  SECURITY LIGHTING IN CONTINUOUS OPERATION
SICHERHEITSBELEUCHTUNG IN DAUERSTELLUNG
-  SECURITY LUMINAIRE
SICHERHEITSLEUCHTE
-  EXIT LUMINAR
HINWEISLEUCHTE
-  RECORD PANEL
MELDETABLEAU
-  CENTRAL BATTERY EQUIPMENT
ZENTRALBATTERIEGERAT
-  CABLE E30
KABEL E30

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
B 14.1.7.2	Types of Light Fixtures		B 01
(1)	Escape sign light fixtures with identification "EXIT", green lettering on white background in the course of escape routes at crossings and junctions. Arrangement in corridors, in staircases and at all exit doors, size under consideration of appropriate recognition widths.	NFPA 70 NEC	B 02
	Product and type: PRÄZISA-KUBUS or equal	VDE 0108/ 6.2	B 03
(2)	Proportionally, light fixtures of general lighting or separate emergency light fixtures as per coordination with DPW in escape routes. Arrangement in corridors and staircases, in mechanical rooms, in arms room and each one light fixture at exit doors in outside area. This lighting in emergency mode serves as basic orientation lighting also with general network supply.		B 04
			B 05
(3)	Exterior light fixtures can either be in stand-by mode or be activated by means of a photo-electric switch. 2 emergency light fixtures at entrances can be supplied with one current circuit.		B 06
(4)	The current circuits of security lighting shall be represented with appropriate symbols in the electrical plans.		B 07
(5)	Round current circuit identification signs with Arabic figures in red color shall be provided at all emergency light fixtures and emergency light supply devices.		B 08
B 14.1.7.3	Marking of Escape Routes		B 09
(1)	The travel in direction of exits and emergency exits shall be indicated by approved, well legible signs.	CABO/ ANSI 117.1	B 10
(2)	At every point of an escape route, where 2 escape directions are determined, both directions shall be indicated.		B 11
(3)	The signs for escape sign light fixtures shall have the identification EXIT green on white background in conformance with the applicable American standards, which shall be well legible at a distance of not less than 30 m (100 ft) under normal conditions.	NFPA 170	B 12
(4)	The direction pointer shall be applied outside of the identification EXIT, the spacing to the letters shall not be less than 1 cm and shall not be arranged separate from the light fixture body.		B 13
			B 14
			B 15

DESIGN GUIDELINES

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SOURCE

(5)

Emergency exit light fixtures shall be tested as to the functioning of light sources at intervals of 30 days.

(6)

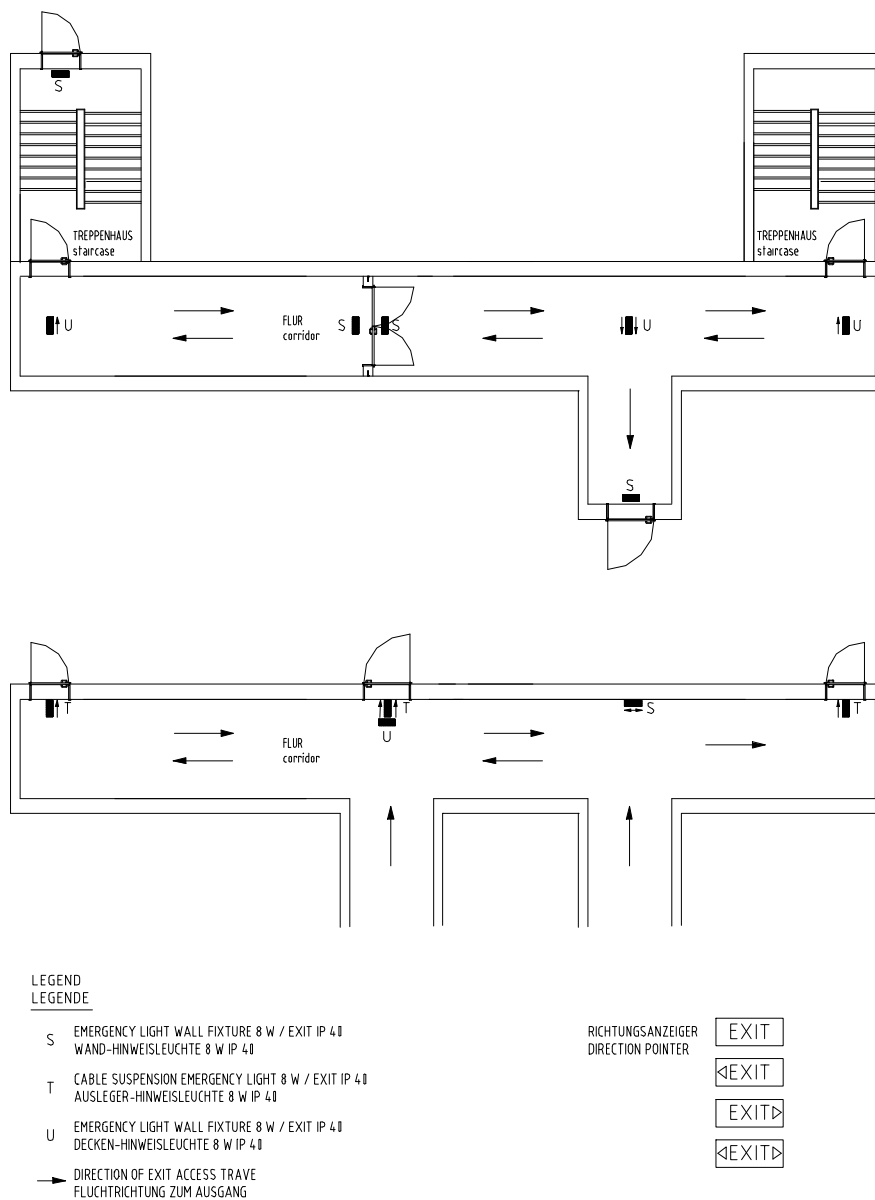
The light sources within the light fixture are typical incandescent bulbs, fluorescent tubes or light-emitting diodes, which are explicitly meant for this purpose.

(7)

The security lighting with appropriate standard symbols shall be represented in the electrical plans.

Fig. 14.19

**SAMPLE MARKING OF ESCAPE ROUTE
BEISPIEL KENNZEICHNUNG VON FLUCHTWEGEN**



B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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		SOURCE	
B 14.1.8	LIGHTNING PROTECTION AND GROUNDING		B 01
B 14.1.8.1	Exterior Lightning Protection		
B 14.1.8.1.1	General		B 02
(1)	An exterior lightning protection system with roof intercepting and connection lines, down-conductors on stormwater downspouts, surface-mounted disconnection points shall be erected above-grade or below-grade points with ground lead-in rods.	DIN VDE 0185 Part 1 IEC, EN, NFPA 780 US.NEC	B 03
(2)	Wiring material shall generally consist of round wire of wrought aluminum alloy and/or galvanized steel, dimensions 8 mm, in case of stormwater gutters and stormwater downspouts of copper, above-grade wires with copper conductor and connecting points with the grounding system with double-metal inlays and corrosion protection.		B 04
		DIN 48 801- DIN 48 852	B 05
			B 06
B 14.1.8.1.2	Execution		
(1)	In conformance with DIN V ENV 61024-1 (VDE 0185 Part 100), paragraph 1.4, exterior lightning protection measures shall be divided into protective classes. The description of the system and specification of items shall correspond to the quality to be accomplished in accordance with the calculation.		B 07
(2)	The selection of conductor brackets will be made according to the roof, the type of roofing and the wall covering. For compensation of the temperature dependent modification of wire lengths, expansion sections shall be planned every 10 m for roof surfaces that are more than 40 m long. The intercepting facilities shall be connected to the down-conductors without interruption.		B 08
			B 09
			B 10
(3)	Roof structures of electrically non-conducting material are considered as sufficiently protected, if they do not project over the network formed by intercepting facilities by more than 0.3 m. In case the distance of 0.3 m should be exceeded, the roof structure needs to be protected by a separate intercepting facility system (e. g. collector tips, air terminal rods), which will be connected to the next lightning arrester.		B 11
			B 12
(4)	Roof structures of metal with and without electrical installations (ventilation ducts, fans, air-conditioning systems, electrically driven roof couplings etc.) shall not be directly connected to lightning arresters. Smaller roof structures shall be protected by means of an air terminal rod located next to it and within a protection angle in conformance with the protective class. Larger roof structures shall be protected by means of a lightning arrester network or conductor rope. Chimneys shall be protected by means of air terminal rods.		B 13
			B 14
			B 15

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<p>(5) Existing sheet metal frames and/or covers can replace air terminal rods without any restrictions, under the condition that they have the minimum thickness required in accordance with the applicable regulations and standards, e. g. copper, minimum thickness 5 mm, galvanized steel 4 mm.</p> <p>(6) The steel reinforcement shall be used as additional down-conductor and protection for reinforced concrete buildings. Not less than one connection at the transition from the air terminal rod to the down-conductor (roof edge) and at the bottom of the down-conductor shall be planned per down-conductor.</p> <p>B 14.1.8.1.3 Calculation of the Exterior Lightning Protection</p> <p>(1) Changes in conformance with DIN V ENV 61 024-1 (08-96):</p> <p>Nc-calculation (accepted strike frequency) Ng-calculation (density of earth lightning) Ae-calculation (equivalent collector area of structural facility) Ce-calculation (coefficient for consideration of calculations of the required efficiency in percent)</p> <p>Calculations of the required efficiency in percent.</p> <p>Result: lightning protection system, protective classes I, II, III or IV with or without additional protection measures.</p> <p>Safe distance in accordance with DIN V ENV 61 024-1 (08.96):</p> <p>Result: safe distance = minimum distance between two conducting elements within the structural facility to be protected, beyond which dangerous sparking will not occur.</p> <p>Results from the following registration sheets shall be taken as a basis for the calculations.</p>	<p>SOURCE</p> <p>DIN V ENV 61024 VDE V 0185 Part 100 Tab. 4 U.S. NFC Standard 70 + Standard 780</p>	B 01
		B 02
		B 03
		B 04
		B 05
		B 06
		B 07
		B 08
		B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

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Fig. 14.20

TABLE REGISTRATION SHEET CALCULATION OF LIGHTNING PROTECTION CLASS TABELLE ERFASSUNGSBOGEN FÜR BLITZSCHUTZKLASSENBERECHNUNG

Type of construction of walls

reinforced in-situ concrete, metal facade throughout	
prefabricated elements connected with each other in conductive way	
frame of steel or concrete connected throughout	
masonry, concrete without reinforcement	
prefabricated elements not connected with each other in conductive way	
timber framework or other combustible materials	

Roof construction

steel	
reinforced concrete	
reinforced concrete prefabricated elements	
wood	

Roofing

reinforced concrete	
sheet metal	
tiles, slate	
synthetic foils	
roofing felt, gravel pressing roof	
soft roofs	

Roof structures

reinforced concrete	
non-grounded metal parts, antennas	
electric appliances	
sensitive electric roof (e. g. monitoring camera, temperature sensor)	

Utilization by persons

no danger of panic	
moderate danger of panic	
considerable danger of panic	

Type of building content

non combustible, hardly inflammable	
inflammable	
explosive system	
potentially explosive system	
nuclear facility	

SOURCE

DIN V ENV
61024-1
(VDE V 0185
Part 100)

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

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		SOURCE
Value of building content		B 01
simple equipment		B 02
valuable equipment		
particularly valuable equipment		
irreplaceable		
Measures and facilities for reduction of damage		B 03
automatic fire extinguishing device		B 04
fire retardant facility		
fire alarm device		
no measures and/or facilities		
Environmental impacts		B 05
none		B 06
moderate		
high		
very high		
Failure of important supply services provided by facilities of the building		B 07
no failure		B 08
important failure		
very important failure		
Other consequential damages		B 09
none		B 10
moderate		
high		
very high		
Building dimensions		B 11
length		B 12
width		
height		
Relative location of the structural facility		B 13
surrounded by smaller buildings		B 14
surrounded by buildings of the same height		
isolated facility		
isolated on a hilltop		
		B 15

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	SOURCE	
B 14.1.8.2 Grounding System		B 01
(1) There is generally no possibility for erection of a foundation earth connector in renovation projects.	DIN 18014	B 02
(2) Flat strip ring grounds of stainless steel V4A 30x3.5 mm shall be used. At locations, where ring grounds cannot be installed and/or for possibly required improvement of the total ground resistance values, deep driven rods, multi-sectional assembly of rods, stainless steel V4A 20 mm Ø, in single lengths of 1500 mm, with corrosion-proof coupling and driving tip with connections between deep-driven earth rod and ring ground, exclusively in the ground, shall be used for the grounding system.	VDE 0186 /6.3.4.5 VDE 0185 /5.3.6 VDE 0151 VDE 0185 Part 1	B 03
(3) Observance of an earth transition resistance of max. 4 Ω is required. A metering protocol shall be provided.		B 04
B 14.1.8.3 Internal Lightning Protection, Overvoltage Protection, Potential Equalization		B 05
B 14.1.8.3.1 Internal Lightning Protection		B 06
(1) Lightning arresters according to DIN VDE 0675, Part 6/11.89 shall be planned for utilization in the main building distribution panel at the lead-in point of power technical wires into the building for secondary voltage installations.	VDE 0675/ Part 6	B 07
(2) Overvoltage down-conductors shall be installed at all disconnection terminals of all cores of communication wires led in from outside for communication technology.	VDE 0185 Part 1 Para. 6 VDE 0800	B 08
(3) All metal conductors and pipes of all facilities/disciplines inserted into building shall be directly or indirectly connected at the internal lightning protection.		B 09
B 14.1.8.3.2 Overvoltage protection		B 10
(1) The applicable regulations and standards shall be observed for determination of protective measures against overvoltage.	VDE 0185 Part 103	B 11
(2) The live wires and the neutral conductors shall be connected at grounding conductors/ground connections via overvoltage down-conductors in all sub-panels. Overvoltage down-conductors, requirement class C 4-pole as well as in 400 V and also in 208 V parts of floor distribution panels will be used.		B 12
		B 13
		B 14
		B 15

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	SOURCE	
(3) Electrical systems with electronic components and communication/information systems in conformance with DIN VDE 0800 (e. g. telephone system, fire alarm system, antenna system) shall be protected as per Part 10, paragraphs 6.1.2 and 6.3.1 in order to reduce overvoltage to an acceptable equipment value.		B 01
		B 02
(4) The exact choice and determination of overvoltage protection elements for the communication/information system shall be made in cooperation with the supplier and/or manufacturer of the system. The overvoltage protection elements shall not interfere with the functioning of the systems (compatibility of signals).		B 03
		B 04
B 14.1.8.3.3 Potential equalization		
(1) A complete potential equalization shall be performed in the building to obtain a joint electric potential. and	VDE 100 Part 410	B 05
	Part 540	B 06
(2) The main ground connection shall be placed on the main potential equalization bus bar located the in electrical room. Additional potential equalization bus bars shall be provided in central mechanical panels.	VDE 0185 Part 103 VDE 0800 Part 2	B 07
(3) All major metal elements in the building, especially the house installation and the communication systems shall be connected at the potential equalization system.	U.S. NFC Standard 780 and Standard 70	B 08
(4) Grounding of the shower tray inside the bathrooms as well as the potential equalization shall be performed with connection at the corridor potential equalization conductor.	VDE 0100 Part 701	B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

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USAREUR - Restoration Program of Troop Billets - Standard 1+1

			SOURCE
B 14.2	COMMUNICATION AND INFORMATION	TECHNICAL	B 01
SYSTEMS			
B 14.2.1	US-TELEPHONE (DSN) AND DATA SYSTEMS		B 02
(1)	US telephone and data systems shall be in conformance with the Command Statement of Work of the 5 th Signal command, dated May 6, 1998, reference: "Installation of a Cable Distribution System in U.S. Facilities in Europe.		B 03
(2)	Furthermore, the design keeps to the applicable regulations EN 50 022, EN 50 024, EN 50 082-1, DIN/EN 50 173, IEEE 802.3U. All other applicable DIN and VDE regulations shall be incorporated in a project specific way. Regulations concerning electromagnetic compatibility and fire protection regulations are basically applying for all projects.		B 04
(3)	Procurement/provision of a single lockable telecommunication room in basement and/or 1 st floor, if the building has no basement. The telecommunication room shall be planned in the center of building. The main cabinet for the US telephone/data cable network, main distribution panel for TELEKOM telephone network and the cabinet for the Telekom Kabel Service (TKS) shall be placed in this room.		B 05
(4)	Every distribution panel and/or data cabinet shall be provided with a lockable door with independent locking.		B 06
(5)	The door to the communication room will be equipped with a magnetic card locking system (SAFLOK-Electronic Key Locks) with separate system card for these doors, which will be made available for all offices and/or firms involved in the project (DPW, 5 th Sign. Command, TELEKOM, TKS). Access to the building from outside shall be guaranteed for the responsible departments in an appropriate manner.		B 07
(6)	Generally, the following cable conduits with pull wire shall be installed from exterior area to the communication room:		B 08
- 1 pipe	DN 110 for the DSN-telephone cable		B 09
- 1 pipe	DN 110 for the TELEPHONE-cable		B 10
- 2 pipes	DN 50 for fiber optic cable		B 11
- 1 pipe	DN 50 for broad-band TV cable of TKS		B 12
- 1 pipe	DN 110 with sealing insert and system cover with 1 connecting piece, exterior diameter 27 mm, incl. rubber plug as reserve for subsequent lead-in of cables.		B 13
			B 14
			B 15

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USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
B 14.2.1.1	Existing/new US exterior telephone/data cable	B 01
(1)	The existing US telecommunication exterior cables or the cables to be installed new for building connection shall be led to the communication room at the shortest possible way within the building and/or, in case of relocation of the original location of the building distribution, if required, sleeve connected in the ground outside. The installation shall be performed with cables A-2YF(L)2Y n x 2 x 0.6 mm St III Bd.	B 02
(2)	A transition sleeve shall be installed in communication room for the transition of the exterior cable to the inside cable. The inside cable shall be placed at the LSA-Plus-disconnection strips in the building distribution panel with the number of all double wires of led-in cables. Overvoltage modules will be installed at the disconnection strips.	B 03
B 14.2.1.1.1	US telephone/data network cabinet	B 04
(1)	The distributor panel cabinet for US telephone and data cable systems shall be installed in the telecommunication room in basement. Preference shall be given to distribution panels 42 HE with profiled rails, unless the scope of installation is larger. Several distribution cabinets shall be provided for larger facilities.	B 05
(2)	<u>Execution</u> Prefabricated network cabinet 42 HE, make RITTAL TYPE DK 7791 or equal, in 2 mm thick sheet steel implementing, reinforced profile frame construction of 9-times edged hollow section with circumferential square and round perforation in 25 mm DIN dimensional grid in width, height and depth, for fastening of additional extension components. - Stiffened by zinc-die-cast-corner connector in the corners, for installation of transportation ring loops. - The profile frame construction shall be capable of bearing a load of 13,000 N. - Roof flashing for cable lead-in with a stationary and a movable section, each with rubber clamp profile for sealing. - Front doors of aluminum profile, frame enameled like cabinet, RAL 7035. 180° hinges, as inspection door of 3 mm single-pane laminated glass. - Back door of sheet steel with removable square frame which is perforated in DIN-dimensional grid; right and left rabbeted. - Front and back door with ERGOFORM-handles and profile cylinder, locking 3524E. - Cable lead-in also from the bottom, via three-sectional bottom sheets which can be exchanged among each other. - 100 mm base of sheet steel, RAL 7022, with removable width and depth trims, front trim with gill embossing for ventilation. - Two system frames with channels of punched holes installed in cabinet depth, for fastening of further elements in network cabinet. - One intermediate shelf with associated fastening material shall also be furnished, which will be installed locally, if required. - Lockable side walls mounted, same locking as doors. - Two 486.2 mm (19") profiled rails, 42 He, on fastening angles in the front; two 486.2 mm (19") profiled rails, 42 HE, on fastening angles in the back, pre-assembled. Profiled rails are adjustable in depth in grid of 25 mm.	B 06
		B 07
		B 08
		B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
The cabinet shall be fastened with anchors to the floor and be accessible from the front and from behind.	B 01
It shall have a space reserve of not less than 30 %. If this direction cannot be met, a second cabinet shall be installed.	B 02
(3) <u>Equipment</u>	B 03
<i>For connection of the US main telephone line of the building:</i>	B 04
- LSA-Plus2-profiled disconnection strips in the cabinet, at the bottom, arranged in the front;	B 05
type/type of delivery: 1 set = 10 ea (100 DA), as per DIN 47 608.	B 06
Suitable for plugging in of patch cables.	B 07
Placing of 4 pairs as per EIA/TIA 568-A	B 08
- Overvoltage protection modules with 2-pole down-conductors shall be mounted on the disconnection strips in main distribution panel for all double wires of the DSN-supply cable.	B 09
- LSA-Plus-profiled ground wire strip, 34-pole, with large switching wire guiding loops.	B 10
- Connection at potential equalization.	B 11
- All parts compatible with Rittal mounting clamps and with Rittal round rod profile.	B 12
<i>For US telephone and data cable connections:</i>	B 13
- 19" patch panels, CAT5, 1 height unit (HE), 24 connection outlets RJ 45, 8-pole. EIA/TIA TSB 40, LSA-Plus-connection technique highly screened, for outgoing US telephone and data connections.	B 14
- Screening bands for cable fastening, with cable intercepting strips, make RITTAL.	B 15
- The number of patch panels depends on the number of connection sockets to be installed in the user building.	B 16
- One switching panel with cable clamps for patch cables shall be provided between each two panels.	B 17
Arrangement of patch panels in upper part of the cabinet:	B 18
- data connections at the top	B 19
- telephone connections below	B 20
- space reserve in between	B 21
Space reserve for 19" light wave guide patch panels according to requirement.	B 22
Space reserve for active components H > 650 mm.	B 23
Additional connection cable with plugs (patch cable)	B 24
RJ45-RJ45, length 2 m, color blue and RJ45-LSA Plus, length 3 m, color gray in required number	B 25
4 each test cables LSA- 4 mm banana coupling 3 m long shall be delivered per cabinet.	B 26
	B 27
	B 28
	B 29

DESIGN GUIDELINES

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SOURCE	
(4) <u>Accessories</u>	B 01
- Ventilator unit, installed in roof, without loss of height units, completely wired, including temperature control device. Factory-finished unit, equipped with 4 ventilators.	B 02
- 8-fold receptacle lath with overvoltage protection, without switch, installation in the back area of the cabinet. Duplex receptacle for maintenance purposes and measuring devices in the upper front area of the cabinet.	B 03
- 18 watt fluorescent tube with electronic ballasts and switches.	B 04
- All parts in one cabinet grounded completely in star-type arrangement. The ground wires are placed on an isolated fastened grounding bar. Connection at potential equalization.	B 05
- A cable reserve in the form of cable loops shall be provided in the distribution cabinet, accessibility to all components in the front and in the back of the cabinet shall, however, be guaranteed.	B 06
(5) <u>Power supply</u>	B 07
Installation of a small distribution panel for supply of the main distribution cabinet.	B 08
Installation 3-phase, 5-pole wiring, connection at the nearest distribution panel with appropriate main fuses.	B 09
Small distribution panel shall be equipped with 3x 16 A circuit breakers, characteristics B. Equipment power circuits, light circuits and service receptacles shall be distributed among the three phases.	B 10
The power circuit for the ventilators shall be the same supply source as the electronics.	B 11
B 14.2.1.1.2 Cable Network	B 12
(1) The telephone and data lines for the office rooms shall be installed each separately, in star-type arrangement, between distribution cabinet and connection sockets. CAT 5-cable S/UTP, 4x2xAWG 24/1 - 100 Ohm shall be installed for both networks. The maximum cable length between distribution panel and terminal connecting box shall not exceed 90 m. A second building part distribution panel shall be provided in basement in corridor or room (no separate telecommunication room) at larger cable lengths exceeding 90 m	B 13
(2) Light wave guides shall not be used.	B 14
(3) Cable courses and cable ducts shall have a space reserve of approx. 30 %.	B 15

DESIGN GUIDELINES

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SOURCE	
Cable ducts for data lines can cross secondary voltage line courses. In case of parallel installation of data cables and secondary voltage lines, attention shall be paid to the fact that, as per IEEE 802.3U (100 BaseT), CAT 5, 100 MHz-measuring results will be observed or exceeded.	B 01
If this should not be the case, the data lines shall be installed with spacings to other cables or sheet steel ducts shall be used.	B 02
The measuring results will be observed in most of the cases, if no secondary voltage consumer cables with connection outputs more than 2 kW are running in parallel (air-conditioning systems, distribution panel supply lines, etc.).	B 03
Joint installation of secondary voltage and communication lines in a sheet steel duct or on a sheet steel carrier trough is allowed, if both cable areas are separated by a grounded partition and if all grounding conditions are adhered to.	B 04
	B 05
B 14.2.1.1.3 Grounding/Potential Equalization	
(1) Installation of the potential equalization bar in the vicinity of the network cabinet. Connection at best possible grounding point of the building with sufficient cross section. Ground resistance measurements shall be accomplished prior to this. A metering protocol shall be prepared. If the building ground connection is insufficient, additional deep driven rods shall be installed until a perfect measuring result will be obtained. Connection of network potential equalization of the data-cabinet at the new installed grounding.	B 06
	B 07
	B 08
(2) All metal cable ducts and cable courses shall be installed, as far as possible, without interruptions and shall be connected by screws with each other. A perfect, electrically conductive ground connection shall be guaranteed by pre-treatment of materials according to the directions of the manufacturer. The treated parts shall then be protected against corrosion in a permanent manner!	B 09
	B 10
(3) Where it will not be possible to install metal ducts and/or cable courses without interruptions, the points of interruption shall be connected with each other in an electrically conductive way. Only prefabricated copper-flat strip ground wire connectors with a high cross section shall be used for this purpose (low-inductance).	B 11
	B 12
Each one connection to the right and to the left of the duct and/or cable course. Original parts of the corresponding manufacturer shall be used. Round wires (NYM-J) with cable lugs etc. are no longer allowed. The mounting instructions of the duct manufacturer are binding.	B 13
	B 14
	B 15

DESIGN GUIDELINES

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SOURCE	
B 14.2.1.1.4 Measurements	B 01
Measurements shall be accomplished for every single telephone and data line and it shall be put down in writing that the CAT5-standard was reached or exceeded.	B 02
Measuring device: MICROTEST "PENTASCANNER +" or equal, with connected printer for the reports.	B 03
B 14.2.1.1.5 Plan Documents	B 04
(1) Plans of the entire system shall be drawn, lettering German and English - in triplicate - as well as one additional reproducible master print.	B 05
(2) In addition to that, the plans shall be made available in electronic form in format AUTOCAD DXF .	B 06
(3) The room numbers shall be taken from the original drawings, not from existing room identifications within the buildings.	B 07
B 14.2.1.1.6 Connections	B 08
(1) Category 5 connection sockets RJ 45, duplex, for 8-pole plug as combined telephone and data box (duplex receptacle WESTERN MODULAR), fully screened.	B 09
Left socket of duplex receptacles: telephone Right socket of duplex receptacles: data line	B 10
The connection sockets shall be identified in a permanent way and in typewriting. Identification: TELEPHONE left at the top and DATA right at the top	B 11
as well as box identification at the bottom:	B 12
sample:	

DESIGN GUIDELINES

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SOURCE	
(2) Arrangement of connection sockets in office/storage rooms in equipment ducts and/or flush-mounted in regular spacings of approx. 4 m. Each two Schuko-receptacles 230 V and 2 receptacles NEMA 120 V shall be provided next to the connection sockets.	B 01
	B 02
B 13.2.1.2 US-telephone network	B 03
(1) The US-telephone network without data components shall also be arranged in a star-type manner from the building network cabinet to the individual connections.	B 04
(2) CAT-5 cable S/UTP, 4 x 2 x AWG 24/1 - 100 Ohm shall be installed.	B 05
(3) The conditions stated under B 14.2.1.1.2 are basically applying for the installation.	B 06
(4) Wall telephone sockets as modular connection socket system Type SE 630-A-6 with stainless steel plate, 2 bolts and sheet steel flush-mounted box Type US NEMA/UL-514 Steel City shall be used. The telephone sockets shall be installed 140 cm above finished floor level, (horizontal arrangement).	B 07
(5) Arrangement of connections: - in telecommunication room - in arms rooms - in corridor in front of arms rooms, close to the door - in corridors of all floors with corridor lengths max. 50 m 1 outlet max. 80 m 2 outlets more than 80 m 3 outlets	B 08
	B 09
	B 10
(6) Telephones shall not be specified.	B 11
	B 12
	B 13
	B 14
	B 15

DESIGN GUIDELINES

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		SOURCE
B 14.2.1.3	Commercial Telephone Cable Network (TELEKOM)	B 01
(1)	The delivery and installation of feed-in cables into the building including placing in the building distribution panel shall be performed by TELEKOM.	B 02
(2)	An empty pipe from exterior area to the communication room shall be installed according to coordination with TELEKOM, where no TELEKOM-ground cable is existing.	B 03
B 14.2.1.3.1	Building Distribution Panel	B 04
	A separate building distribution panel for the Telekom-network shall be installed in the communication room in basement.	B 05
(1)	Execution:	B 06
	Wall-mounted distribution panel casing of 1.5 mm sheet steel, size as required prefabricated with:	B 07
	<ul style="list-style-type: none"> - inspection door with safety glass pane and safety lock - mounting and C-profiled rails for cable interception, - cable flanged plates at the top and at the bottom - grounding bar - wall fastening holder - swiveling element of sheet steel - 19-Inch-profiled rails installed on C-rails, adjustable in depth - 25 mm perforated grid in front and back frame - each one outlet filter, left and right on the side, with the possibility to install a ventilator extension set 	B 08
(2)	Equipment:	B 09
	<i>In the upper area</i>	B 10
	19" patch panels CAT5, 1 height unit (HE) with 24 connection sockets RJ 45, 8-pole, EIA/TIA TSB 40, LSA-Plus connection technique, highly screened incl. screening bands for cable fastening with cable interception strip	B 11
	The number of patch panels depends on the number of sockets to the connection boxes in the entire building, plus not less than 10 %.	B 12
	<i>In the bottom area</i>	B 13
	LSA-Plus-2-separation-profile laths, suitable for insertion of patch cables, with connections of all incoming cable conductors.	B 14
	Additional connection cables with plugs (patch cable) RJ45-LSA Plus, length acc. to distribution panel size.	B 15

DESIGN GUIDELINES

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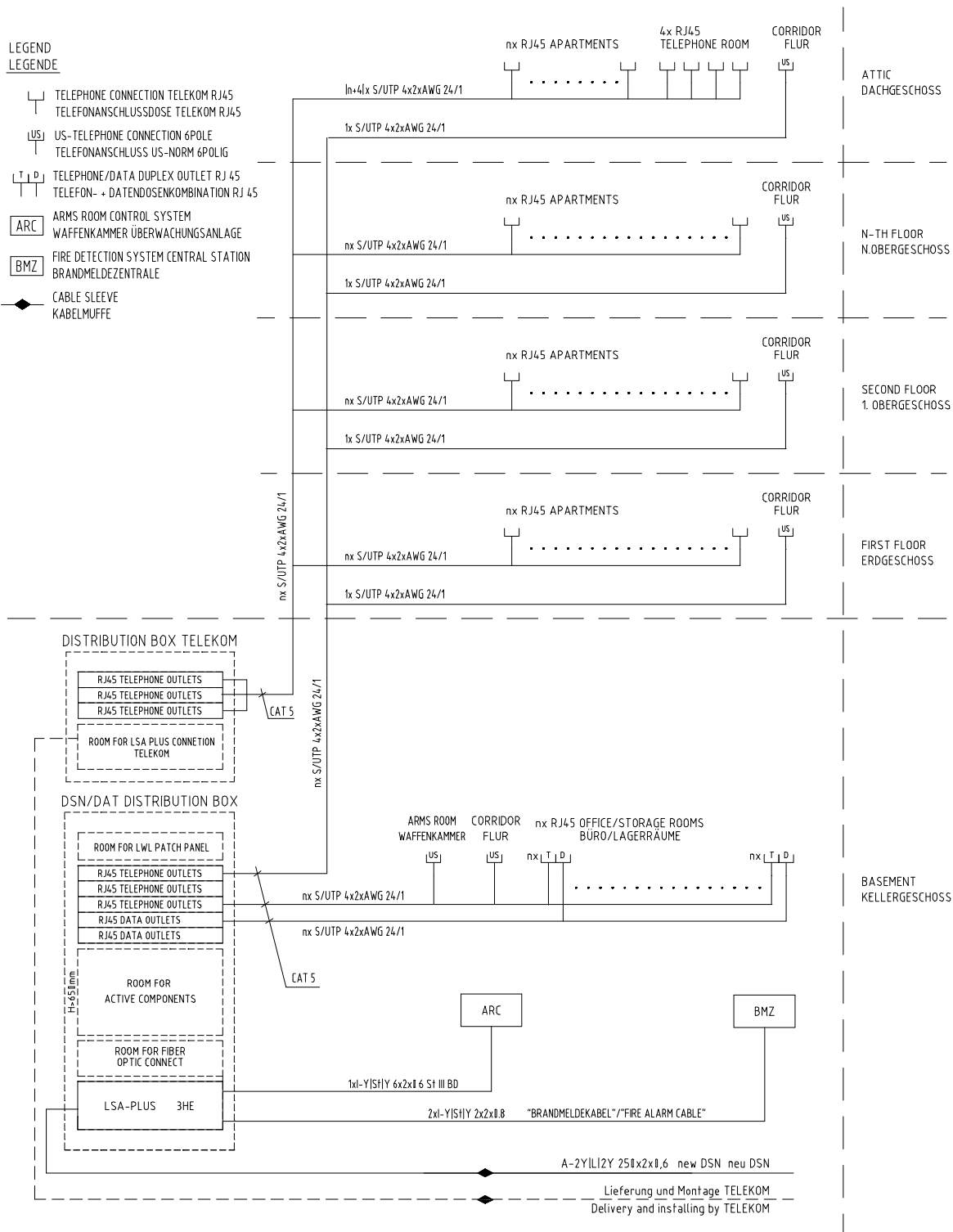
SOURCE	
B 14.2.1.3.2 Cable Network	B 01
(1) The Telekom-cable network shall be completely installed with CAT5-cables S/UTP 4x2xAWG 24/1 - 100 Ohm. The installation from the building distribution panel (19"-wall cabinet) in the communication room to all connection sockets within the building shall be accomplished separately, in star-type arrangement. A second building part distribution panel shall be provided in basement in corridor or room (no separate telecommunication room is required) at larger cable lengths than 90 m plus 10 %.	B 02
(2) Connection in the building distribution panel shall be performed on 19" patch panels. The cables shall be identified with room and connection box numbers on both ends according to the coordination with the authorized DPW, the identification shall be incorporated into the plans.	B 03
(3) The telephone cables shall be installed in pipe, flush-mounted, within the apartments.	B 04
B 14.2.1.3.3 Connections	B 05
(1) Telephone connection sockets Type RJ 45, single, with 45° socket in flush-mounted implementing, with a removable RJ 11-adapter as plastic insert element - no projecting adapter - for 1 communication device with 8-pole western plug.	B 06
(2) Arrangement of connections: - each 1 telephone connection socket in living spaces - 4 connection sockets in the telephone room in the attic	B 07
	B 08
	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

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Fig. 14.21

SAMPLE SURVEY OF TELEPHONE SYSTEM BEISPIEL ÜBERSICHTSSCHEMA TELEFONLEITUNGSNETZ



DESIGN GUIDELINES

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		SOURCE
B 14.2.2	ANTENNA SYSTEM	B 01
(1)	Each building shall be provided with a commercial broad-band cable television system.	B 02
(2)	The installation of the complete BK-system shall be accomplished as per the cable requirements and instructions of the TELEKOM cable service (TKS Kaiserslautern).	B 03
(3)	The installation of broad-band cables in the exterior area, building lead-in and connection at the point of interconnection shall be performed by TKS.	B 04
(4)	In buildings where no BK-connection is existing, the precise terms of the new connection shall be determined in coordination with TKS in the course of the design phase. All precautions for granting of the undisturbed reception within the adjacent buildings shall be made during the possibly required alteration work in the course of the renovation measures at supply cables in coordination with the authorized DPW and TKS.	B 05
		B 06
(5)	If a TKS-antenna system has already been installed within the building prior to renovation, it shall be removed and reviewed by the designer in cooperation with TKS. Dismantling of system parts and reinstallation shall be incorporated into the specifications. The possibly required repair work for operating devices, which shall be accomplished by TKS, shall be included in construction costs.	B 07
		B 08
(6)	In buildings where no BK-connection will be possible in the course of renovation, a terrestrial antenna for AFN TV-reception will be installed on the roof until provision of such a connection.	B 09
		B 10
B 14.2.2.1	Building distribution panel	
(1)	The Main TKS-cable distribution panel cabinet will be installed in communication room in the basement of the building together with the building distribution panels of the DSN/data system and the TELEKOM-telephone system.	B 11
		B 12
(2)	The BK-distribution cabinet of sheet steel, size depending on the type of network structure, shall be furnished with given standard locking Geco-turn bolt lock, Code-No.: 496 733 and integrated into the potential equalization. The connection of the F-grounding block as well as the metallic multitabs within the distribution cabinet and to the main potential equalization bar within the building shall be provided by means of a potential equalization line of not less than 4 mm ² Cu (depending on the distance). A TKS-adhesive label shall be put on the front.	B 13
		B 14
		B 15

DESIGN GUIDELINES

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		SOURCE
B 14.2.2.2	Floor distribution panel cabinets	B 01
(1)	One or more TKS floor distribution panel cabinets shall be provided on 1 st floor and on top floors. The distribution panels shall be equipped with lockable door with locking cylinder of firm TKS, GeCO rotary bolt connection code no. 496733.	B 02
(2)	Attention shall be paid to the fact that a maximum of 20 connections can be connected at a distribution cabinet and that the maximum cable length from the distribution panel to the far distant subscriber connection box (TAD) shall not exceed 40 m. Moreover, maximum 3 distribution panels can be installed in one cabinet.	B 03
(3)	The distribution panels will be installed in wall recesses in corridors, the wall recesses will be provided with a lockable front door in fire resistance class I30.	B 04
(4)	Each two surface-mounted Schuko-receptacles shall be installed in every cabinet. 230 V-power circuits shall be provided for the receptacles, with separate fuse rating from building installations.	B 05
(5)	The following system components shall be integrated into the floor distribution panels and connected at the signal sources: - BK-main connection amplifier with equalizer frequency range from not less than 47 to 862 MHz with passive backward path from 5 to 45 MHz - low pass filter with band pass 0 - 169 MHz, blocking frequency 175 - 862 MHz, and band pass 0 - 501 MHz, blocking frequency 519 - 862 MHz, blocking depth > 40 dB - plug main unit 15 - 18 V, DC, 850 mA - backward path suitable metal screened junctions, - distribution amplifier - distribution panel - max. 3 ea per cabinet - , - multiple switch with F-connector and potential connections - final resistances in F-implementing, tightening with special socket wrenches - grounding block (no grounding bar!) in F-convactor technique. Connection of incoming and outgoing coaxial cables of amplifier input and output shall be performed by means of F-connectors at grounding block.	B 06
(6)	Mounting notes of the manufacturer shall be observed, wiring shall be accomplished according to the building specific conditions.	B 07
		B 08
		B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

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		SOURCE	
B 14.2.2.3 Cable Network	(1) The cable network shall be installed as full star system as of distribution panels. The cable installation shall be performed on cable courses, in cable ducts and/or in riser manholes, bunched, in conduit in flush-mounted installation. The minimum distances to the secondary voltage network shall be observed, on principle, separating ridges shall be used.		B 01
			B 02
			B 03
	(2) Coaxial cable, screening size > 80 dB, make BELDEN, type H125 CU or equal, shall be installed as TV-cable. The cable lengths and minimum bending radiuses shall be observed.		B 04
	(3) F-crimp plugs shall be furnished according to the used type of coaxial cable and crimped with an appropriate crimping tool. The connections shall be provided and F-plugs tightened by means of special socket wrenches.		B 05
	(4) The individual outlets shall be identified on both cable ends with the respective room number on permanent markings (cable rings). The identification shall be completed by continuous numbering in clockwise direction, if several connections are existing in the room.		B 06
			B 07
B 14.2.2.4 Connection Boxes			B 08
	(1) Subscriber connection boxes as broad-band branch box according to DIN shall be provided in all living spaces and 2 ea in the game room in the attic.	DIN 45 330	B 09
	(2) 1 receiver connection cable, ready-made, length 1.5 m, screening size > 75 dB, BK-suitable, with 1 additional adapter from IEC-socket to F-connector for connection of a subscriber terminal device with a connection box shall be delivered and connected for every connection box.		B 10
B 14.2.2.5 Notes for Execution			B 11
	(1) A coordination of the system with TKS as well as obtaining of building specific wiring directions shall be made prior to start of installation work. Moreover, a level plan shall be submitted before start of construction.		B 12
	(2) Acceptance forms, metering protocols with each 1 measuring value per frequency band of every subscriber box, multiple switch occupation plans and building first floor plans shall be submitted after completion of the work according to TKS-sample. The documents shall be prepared with electronic data processing programs, the assistance of the TKS can be requested for this.		B 13
			B 14
			B 15

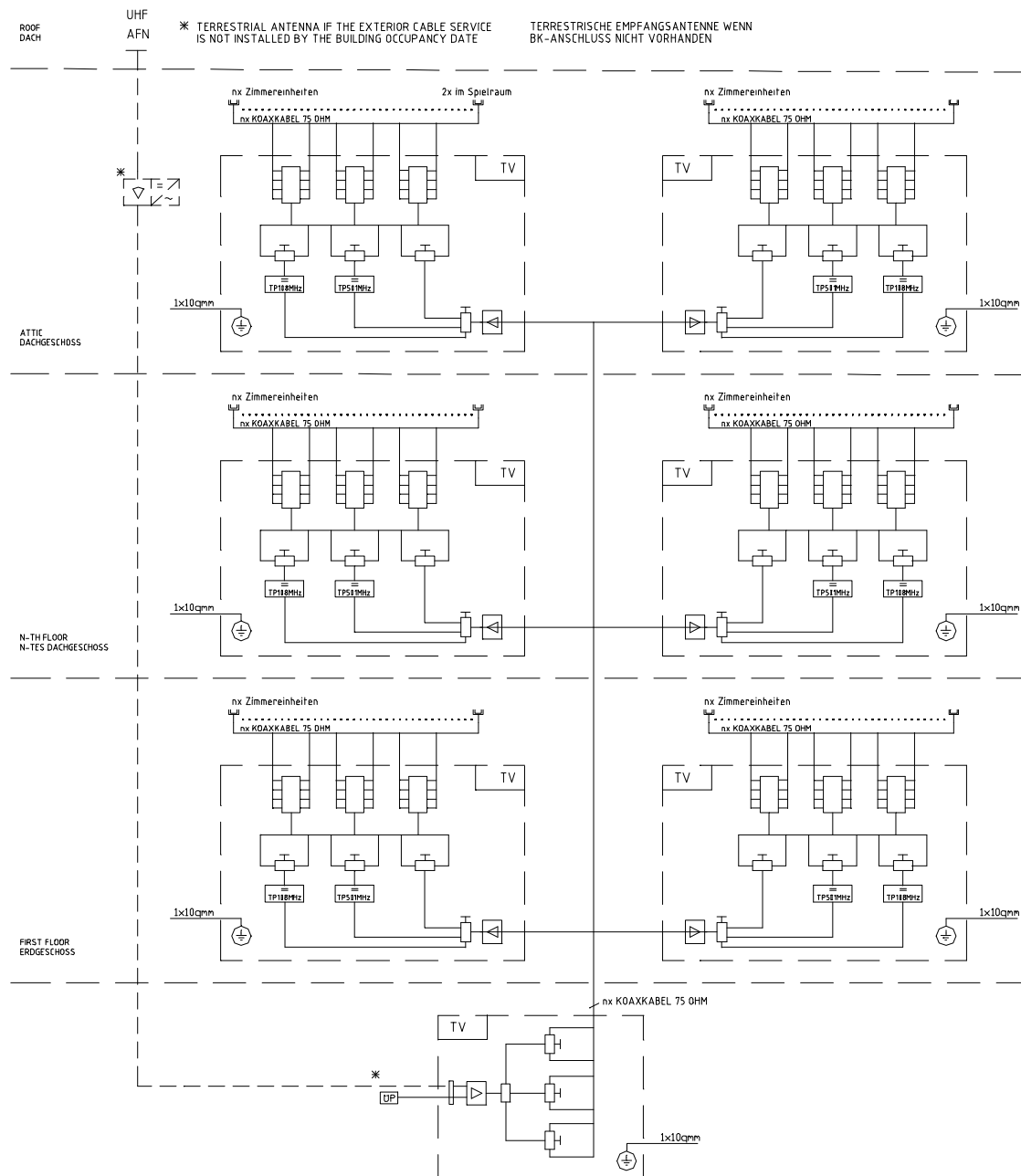
DESIGN GUIDELINES

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SOURCE

Fig. 14.22

SAMPLE SURVEY OF ANTENNA SYSTEM BEISPIEL ÜBERSICHTSSCHEMA ANTENNENANLAGE



LEGEND LEGENDE

	TV-ANTENNA TV-ANTENNE		LOW PASS FILTER 0-108 MHz TIEFPASSFILTER 0-108 MHz
	ANTENNA CONNECTION BOX ANTENNENANSCHLUSSDOSE		LOW PASS FILTER 0-501 MHz TIEFPASSFILTER 0-501 MHz
	AMPLIFIER SYSTEM VERSTÄRKERANLAGE		SPLITTER VERTEILER
	MULTIPLE SWITCH MULTISCHALTER		INTERCONNECTION POINT ÜBERGABEPUNKT
			POTENTIAL EQUALIZATION POTENTIALAUSGLEICH
			STEEL CABINET STAHLBLECHVERTEILER

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

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		SOURCE
B 14.2.3	FIRE ALARM SYSTEM	B 01
B 14.2.3.1	Scope of the System	B 02
(1)	Every building shall be equipped with an automatic fire alarm system.	B 03
(2)	A fire alarm system just for signal transfer, signaling and manual release will be required for erection of a sprinkler system for the entire building according to the valid US and German regulations.	B 04
(3)	As all buildings shall be fully equipped with sprinklers in the future, an entire area protection with automatic detectors will not be realized. Automatic detectors shall only be provided within the rooms and/or areas listed in the following.	B 05
B 14.2.3.2	Fire Alarm Central Unit	B 06
(1)	The central fire alarm unit shall be installed inside the building in the entrance area in direction of the Fire Department approach with the required number of alarm groups of bus technology (ring bus technology) with emergency power supply for 72 hours + 30 minutes, 1 main detector and/or modem for transfer of the fire alarm with overvoltage protection as rough and fine protection for all modems, with 1 set of data intervention cards (routing cards) and the fire alarm control panel. The above listed system parts shall be placed jointly in a lockable surface mounted sheet steel cabinet.	B 07
	A Fire Department intervention plan for all floors, behind plexiglass, shall be put up on the wall next to the central unit acc. to requirement of local fire protection authority.	B 08
(2)	The following elements shall be connected at the central unit:	B 09
	- manual push button alarms and automatic detectors according to alarm areas in conformance with the VDE-guidelines as stated under B 14.2.3.3:	B 10
	- drive of optical and acoustical alarm devices	B 11
	- alarms and connections of drive of door locking devices	B 12
	- voltage supply of all door locking devices with separate current supply acc. to guidelines of Deutschen Institut für Bautechnik (DIBT)	B 13
	- alarms of individual flow alarms of the sprinkler system on floors and of main pressure switch of sprinkler central unit	B 14
	- alarm of extinguishing systems in kitchens and drive of network cut-off in case of fire	B 15

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SOURCE	
B 14.2.3.3 Alarm Detectors and Alarm Transmitters	B 01
Type and arrangement of detectors	B 02
(1) Optical smoke detectors	B 03
- corridors and stairwells at T30/T90 doors to be kept open	B 04
- arms room	B 05
- electrical room	B 06
- telecommunication room	B 07
- sprinkler room	B 08
- building connection room	B 09
(2) Maximum/rate-of-rise temperature detector	B 10
- over the entire area in upper attic	B 11
(3) Manual fire detectors as push button detectors with lettering "FIRE ALARM" in red color.	B 12
- in the course of escape and exit ways at exit doors in corridors and stairwells in exit area towards outside	B 13
(4) Alarm detector contacts of extinguishing systems in kitchens and sprinkler system	B 14
(5) Optical-acoustical alarm transmitters with sound transmitter 104-110 dB(A) and flash lamp, capacity flash energy 2.5 – 5 Ws, flash frequency 1.1 – 3.0 Hz as stroboscope light fixture with white or transparent spherical cap acc. to coordination with the local US Fire Department, with red sign "FIRE", 24 mm letter height, white near or below the alarm transmitter	B 15
- in corridors of all floors	
- in arms room	B 13
(6) Acoustical alarm devices up to 104 dB(A), controllable	B 14
- in mechanical rooms	
- in latrines in basement and attic	B 15

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SOURCE		
(7) 1 red flash lamp, capacity flash energy 5 Ws, shall be installed outside, near or above the entrance in the direction of the Fire Department approach where the fire alarm central unit is also arranged.		B 01
		B 02
		B 03
		B 04
		B 05
		B 06
		B 07
		B 08
		B 09
		B 10
(8) Control elements in ring line (loop) integrated and monitored to orderly function, for individual drive of door locking devices, signal and alarm facilities etc.	DIN 14 675	B 11
(9) Optical smoke detectors for 230 V network connection with integrated signal transmitter 85 dB(A), red LED display and built-in emergency current supply with high capacity condensators for at least 72 hours alarm standby for local alarming will be planned additionally in bedrooms. These smoke detectors will not be connected at the central fire alarm unit.		B 12
(10) Permanently lettered and fastened Resopal detector signs in size and accomplishment acc. to DIN 14675 with information of detector group and detector number shall be provided for identification of all periphery devices		B 13
(11) Fire Department key safe box (FSK) will not be installed.		B 14
B 14.2.3.4 Cable Network		B 15
(1) Wiring of the fire alarm system shall be accomplished in bi-directional ring bus wire technique. The acoustical alarm transmitters and drives shall be wired separately, in star-type arrangement.		
(2) Fire alarm cables with function maintenance JE-H(St)H E30 2 x 2 x 2 0.8 mm, red, with inscription "Fire Alarm Cable" shall be generally installed.		
(3) Modem routes and/or modems of fire alarm system for transfer of alarms outside the building via the telephone cable network with overvoltage conductors.		
B 14.2.3.5 Start-up		
(1) Start-up and turn-over of the system through expert staff of the Contractor and manufacturer of the fire alarm system comprise:	VDE 0833	
- review of all single sensors, signal and control facilities at the site incl. provision of appropriate test report acc. to VDE		
- preparation of metering protocol		
- preparation of acceptance protocol		
- submittal of revision and operation instructions, 3 copies each		
- complete lettering of all operation agents, sensors and fire alarm central unit with accessories		

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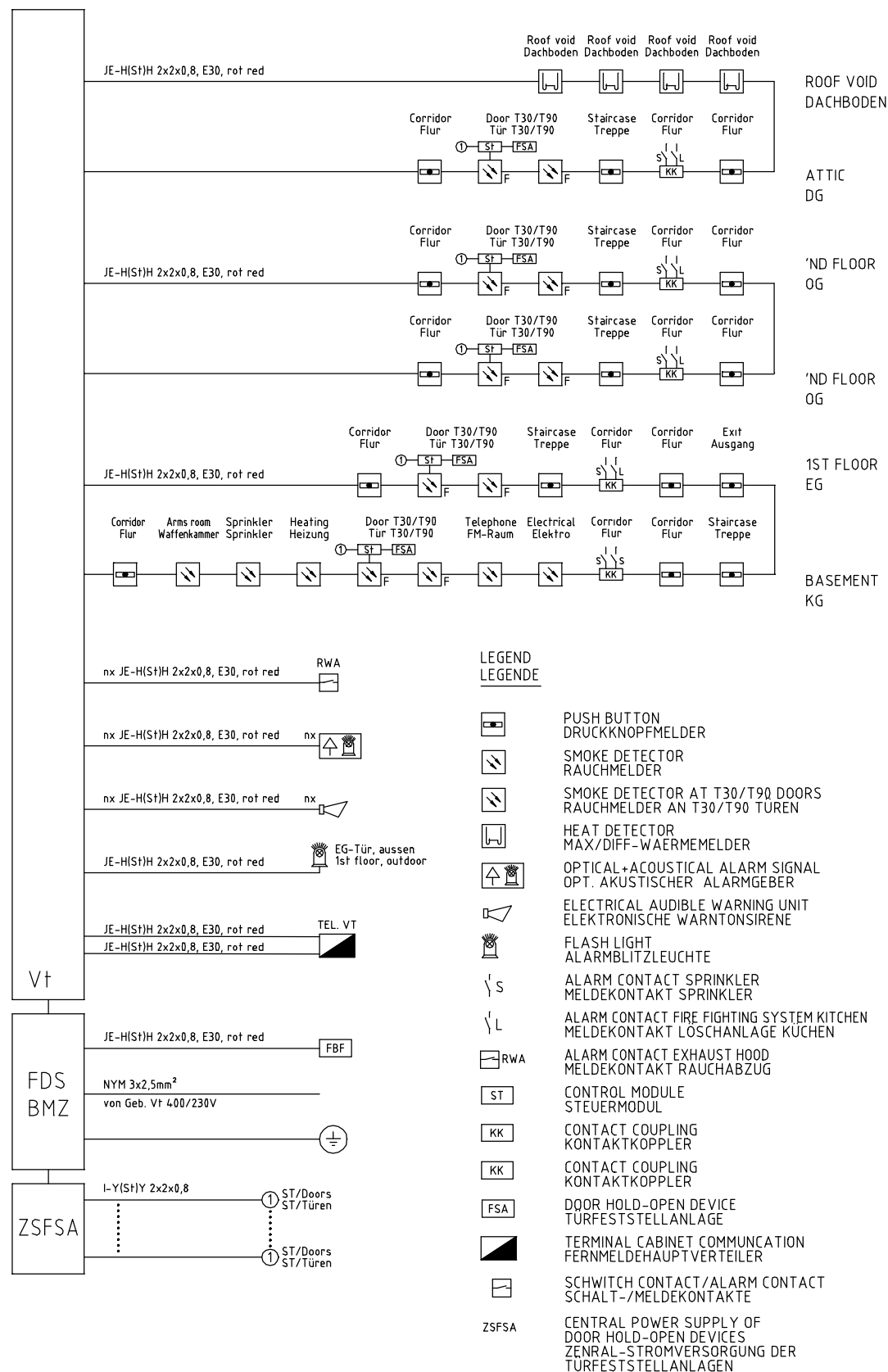
SOURCE	
<p>(2) Inspection documents VDE 0833</p> <p>The following documents shall be prepared and submitted in 3 copies for the entire system:</p> <ul style="list-style-type: none"> - layout plans with represented systems of all sensors and operating devices with DIN standard symbol - central lettering documentation - central improvement condition (panel equipment) - provided customer specific software as paper print as well as additionally on commercial data carrier - central programming sheets - distribution diagrams and occupation - alarm group schedule - block switching diagram incl. representation of switch and alarm contacts of sprinkler system <p>(3) Acceptance Upon completion of the system, an acceptance test shall be performed through the contractor, the authorized U.S. Fire Department and DPW. Fault-free acceptance protocols must be available prior to start-up.</p>	B 01
	B 02
	B 03
	B 04
	B 05
	B 06
	B 07
	B 08
	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

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Fig. 14.23

SAMPLE SURVEY OF FIRE-DETECTION SYSTEM BEISPIEL ÜBERSICHTSSHEMA BRANDMELDEANLAGE



SOURCE

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

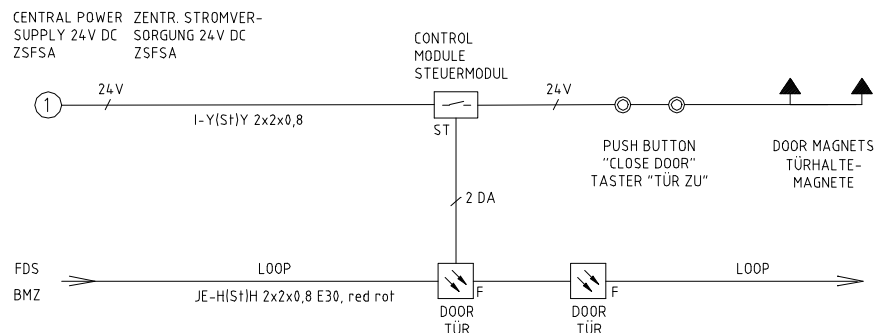
B 15

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USAREUR - Restoration Program of Troop Billets - Standard 1+1

Fig. 14.24

CONTROL SYSTEM HOLD-OPEN-DEVICE ANSTEUERUNG TÜRFESTSTELLANLAGE



B 14.2.4 PREVENTIVE FIRE PROTECTION

(1)

The systems described in this title shall be explained referring to the discipline electrical. A detailed functional description is to be found in titles Structural Fire Protection and Preventive Building Fire Protection.

B 14.2.4.1 Arrester devices at smoke and fire stop doors

(1)

The fire stop doors in corridors and staircases, which shall kept open, shall be equipped with arrester devices (FSA) with door holding magnets for wall mounting.

(2)

Optical smoke detectors in ceiling areas shall be installed for automatic closing of the doors, push buttons in red color with the inscription "TO CLOSE DOOR PUSH BUTTON" shall be placed on both sides of the doors for manual closing. The smoke detectors will be connected to the bidirectional ring network (loop) of appropriate area.

(3)

The arrester devices will be controlled via fire alarm central unit. The door magnet will be separated from the central voltage supply at release of an appropriate smoke detector via a selective control module (located local at arrester device). The parameterization and connection will be accomplished at the fire alarm central unit. The entire function shall be allowed by IfBT in Berlin!

(4)

The current supply of arrester devices (FSA), (sufficient for 72 h emergency current supply) for supply of door adhesive magnets and electromagnetic door closers will be installed to the fire alarm central unit, installed in a sheet steel casing.

(5)

The cabling of FSA will be accomplished with cable I-Y(St)Y 2x2x0.8

(6)

The following sequence closing units should be provided according to coordination with the local US Fire Department:

- All doors on the same floor and all doors to the stairwells on all floors shall close in case of automatic closing of one door.
- The closing of **all** fire stop doors within the building will be given by the central fire alarm unit in case of release of a fire alarm.

SOURCE

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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		SOURCE
B 14.2.4.2	Smoke Exhaust Systems	B 01
(1)	If smoke exhausts are used, they shall be accomplished and connected as follows.	B 02
(2)	Smoke exhaust systems (RWA) with control central units incl. emergency current supply with an operation DC-small voltage will be used in the top area of stairwell.	B 03
(3)	The release of RWA will be accomplished via manual smoke push buttons behind glass with LED displays in stairwell at top stair platform and on 1 st floor.	B 04
(4)	A notification to fire alarm central unit will be accomplished via release of RWA acc. to coordination with the responsible US Fire Department and DPW.	B 05
(5)	The high-voltage current and weak current line network shall be accomplished with security cables with function maintenance E90.	B 06
Fig. 14.25		B 07
SAMPLE SURVEY OF EXHAUST HOOD		B 08
BEISPIEL ÜBERSICHTSSCHEMA RAUCHABZUGSANLAGE (RWA)		B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

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SOURCE

Fig. 14.26

BETRIEBSMITTEL BRANDMELDEANLAGE UND VORBEUGENDER BRANDSCHUTZ													
GESCHOSS STORY													
KELLERGESCHOSS – BASEMENT	RAUM ROOM		HANDMELDER PUSH BUTTON	OPTISCHER RAUCHMELDER VISUAL SMOKE DETECTOR	TEMPERATURMELDER HET DETECTOR	OPTISCH-AKUSTISCHER ALARMGEBER VISIBLE AND AUDIBLE WARNING UNIT	AKUSTISCHER ALARMGEBER AUDIBLE WARNING UNIT	BLITZLEUCHTE FLASH LIGHT	RAUCHMELDER 230V MIT SIGNALGEBER SMOKE DETECTOR 230W WITH WARNING UNIT	MELDEKONTAKTE 1), 2), 3) ALARM CONTACT 1), 2), 3),	EXTERNE OPTISCHE MELDEANZEIGE 4) EXTERNAL ALARM DISPLAY 4)	TÜRHALTEMAGNETE (FSA) MAGNETIC DOOR HOLDER	HANDAUFLÖSETASTER ROT (FSA) MANUAL RELEASING DEVICE
	FLURE CORRIDORS												1)
	FLURE AN RAUCHSCHUTZTÜREN CORRIDORS AT DOOR CLOSING DEVICES												
	WAFFENKAMMER ARMS ROOM												4)
	ELEKTORRAUM ELECTRICAL												
	FERNMELDERAUM TELEPHONE ROOM												
	SPRINKLERRAUM SPRINKLER												2)
	HAUSANSCHLUSSRAUM SERVICE CONNECTION ROOM												4)
HAUPTGESCHOSS – MAIN FLOORS	TOILETTEN LATRINES												
	TREPPENRAUM AN RAUCHSCHUTZTÜREN STAIRCASE AT DOOR CLOSING DEVICES												
	FLURE CORRIDORS												1)
	FLURE AN RAUCHSCHUTZTÜREN CORRIDORS AT DOOR CLOSING DEVICES												
	KÜCHEN KITCHEN												3)
DACHGESCHOSS – ATTIC	SCHLAFEN BEDROOM												
	TREPPENRAUM AN RAUCHSCHUTZTÜREN STAIRCASE AT DOOR CLOSING DEVICES												
	TOILETTEN LATRINES												
	FLURE CORRIDORS												1)
	FLURE AN RAUCHSCHUTZTÜREN CORRIDORS AT DOOR CLOSING DEVICES												
	KÜCHEN KITCHEN												3)
	HAUSAUSGÄNGE (INNEN) EXIT (INSIDE)												
	HAUPTINGANG (AUSSEN) MAIN EXIT (OUTDOOR)												

- 1) STÖRUNGSMELDUNG DER SPRINKLERANLAGE / FAULT ALARM OF SPRINKLER SYSTEM
 2) STÖRUNGSMELDUNG AN DER SPRINKLERZENTRALE / FAULT ALARM AT SPRINKLER CENTRAL CONTROL
 3) LÖSCHANLAGE / FIRE FIGHTING SYSTEM
 4) WENN ERFORDERLICH / IF NECESSARY

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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		SOURCE
B 14.2.4.3	Fire Extinguishing Systems Kitchens	B 01
(1)	An automatic fire extinguishing device for the range area shall be provided in every vapor exhaust hood in kitchens.	B 02
(2)	The power circuit supply cables for the range shall be led to the 3-phase cut-out of the range via the power cut-out unit existing in the control box of the fire extinguishing device.	B 03
(3)	The potential free contact for connection of alarm devices integrated into the extinguishing device shall be wired and connected to the central fire alarm unit for alarming of the Fire Department.	B 04
B 14.2.5	MONITORING SYSTEM	B 05
(1)	A new cable network in closed steel conduit installation shall be installed for the alarm systems in arms rooms according to the directions of the local DPW. The delivery and installation of alarm central unit and operation agents will be accomplished by the responsible DPW.	B 06
(2)	Prior to design, information shall be obtained at the DPW as to whether a cable of the safety system is already existing within the building or in its vicinity. This cable shall be inserted and led to the alarm central unit, if required. A cable I-Y(St)Y 6 x 2 x 0.8 mm shall be installed from the alarm central unit in arms room to the DSN/LAN-cabinet, if this cable connection is missing.	B 07
B 14.2.6	TRANSMISSION SYSTEMS	B 08
	DDC and EMCS-engineering	B 09
(1)	A cross connection panel with LSA-Plus-strips shall be considered for the cable network of the DDC- and/or EMCS-engineering. Location of the distribution panel, preferably in mechanical room in basement, shall be coordinated.	B 10
(2)	Cable connections, each with I-Y(St)Y 4 x 2 x 0.8 mm, shall be conducted from this panel to all power distribution panels in the building, 10 x 2 x 0.8 mm, switch cabinets of mechanical systems, furthermore, all required cable connections for alarms and control commands of the fire alarm system, the security lighting system, the existing and/or possible energy optimization systems (UEMCS or CU MACS etc.).	B 11
(3)	The erection of the cable network shall be coordinated in detail with the local DPW and the mechanical designer.	B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

(4)

Cable installation in the building shall be on cable trays, on riser assemblies, in conduits or surface-mounted ducts and/or flush-mounted in conduits.

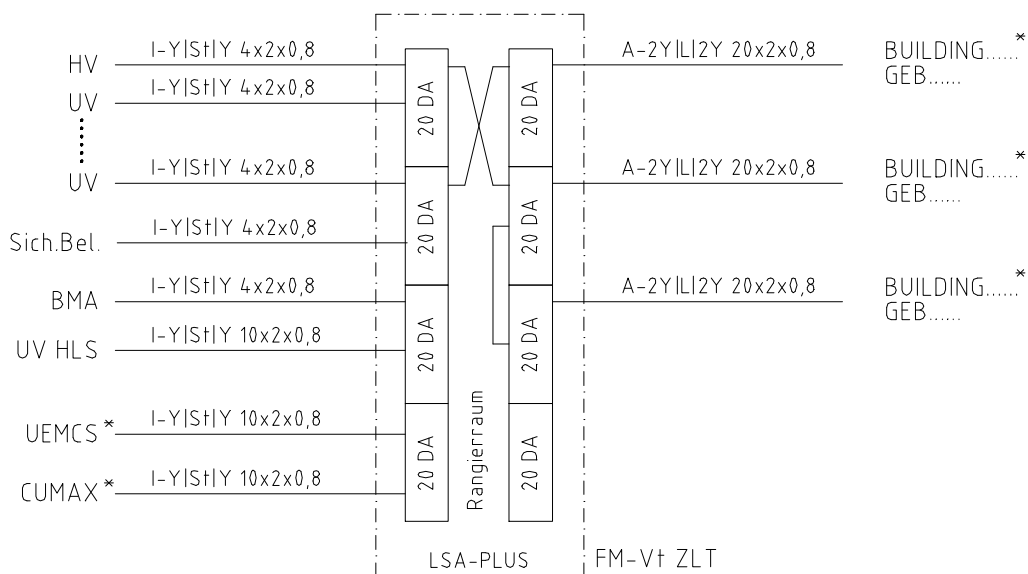
(5)

If available, all EMCS-supply lines conducted to and from the building to other buildings, shall be placed on the panel.

Cables Y-2Y(L)2Y 20 x 2 x 0.8 mm shall be installed to the adjacent buildings, if not existing, but possible.

Fig. 14.27

**SAMPLE SCHEMATIC DIAGRAM EMCS NETWORK
BEISPIEL PRINZIPSCHMA ZLT-NETZ**



LEGEND
LEGENDE

20 DA LSA-PLUS TERMINAL STRIP
LSA-PLUS ANSCHLUSSLEISTEN

UV SUB DISTRIBUTION
UNTERVERTEILER

HV MAIN DISTRIBUTION
HAUPTVERTEILER

Vt COMMUNICATION DISTRIBUTION BOX
FERNMELDEVERTEILER

HVS VENTILATION
LUFTUNG

BMA FIRE DETECTION SYSTEM
CENTRAL STATION
BRANDMELDEANLAGE

UEMCS CENTRAL CONTROL UNIT
ZENTRALSTEUERUNG

CUMAX* IF EXISTING
FALLS VORHANDEN

SOURCE

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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		SOURCE
B 14.3	INSTALLATION - ROOMS	B 01
B 14.3.1	MAIN FLOORS (1st FLOOR and TOP FLOOR)	
All height dimensions shall be adjusted to middle of the tile on tiled walls		B 02
(1)		
APARTMENTS TYPE 1		B 03
Room depth between 4.40 m and 5.90 m Fig. 14.28		
(1.1)		
2 Bedrooms equipped with each		B 04
Wall		
Flush-mounted installation		
- at the bed above night stand	1 change-over switch 1.00 m aFFL for the ceiling light in bed area	B 05
	2 Schuko receptacles 230 V, 0.35 m aFFL,	
	1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL	B 06
- at desk	2 Schuko receptacles 230 V, 0.63 m aFFL	
	1 duplex receptacle NEMA 120V/20A, 0.49 m aFFL	
	1 telephone connection socket TELEKOM 0.35 m aFFL	B 07
- at the TV	2 Schuko receptacles 230 V, 0.35 m aFFL	
	1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL	B 08
	1 TV antenna receptacle, 0.35 m aFFL	
- refrigerator	1 Schuko receptacle 230 V, 0.35 m aFFL	B 09
- at bathroom door each	1 change-over switch with illuminated large area rocker 0.951 m aFFL, for switching of lighting and ventilation, 2 nd step with follow-up	B 10
- at door by closet	1 switch with illuminated large area rocker 0.951 m aFFL	
- at entrance door	1 change-over switch for the first ceiling light in bed area 1.05 m aFFL	B 11
	1 off-switch for the 2. ceiling light, below	
	1 Schuko receptacle 230 V, below	B 12
Ceiling		
Flush-mounted installation		
- 2 surface-mounted ceiling light fixtures with aluminum mirror louver 2xL36W		B 13
- 1 optical smoke detector 230 V with integrated signal transmitter 85 dB(A) for local alarm signals, no alarm transfer to central fire alarm unit (BMZ)		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
(1.2) 2 Walk-in Closets equipped with each	B 01
Wall Flush-mounted installation	B 02
- 1 distribution/room 230/120V, flush-mounted, in corridor wall, top edge = 1.90 m above FFL	B 03
Ceiling Flush-mounted installation	B 04
- 1 surface-mounted ceiling light fixture with prismatic cover 2x TC 11 W	B 05
(1.3) 2 Kitchenettes equipped with each	B 06
Wall Flush-mounted installation	B 07
- 2 Schuko receptacles 230 V, 1.26 m above FFL	B 08
- 1 Schuko receptacle 230 V, 1.96 m above FFL – for microwave	B 09
- 2 receptacles NEMA 120 V/20 A, 1.26 m above FFL	B 10
(1.4) 1 Bathroom (combined) (power circuit supply cables from distribution/floor)	B 11
Wall Flush-mounted installation	B 12
- 1 Schuko receptacle 230 V, 1.66 m above FFL	B 13
- 1 receptacle NEMA 120 V, 1.56 m above FFL	B 14
- 1 connection 230 V for mirror cabinet light fixture 1.90 m above FFL	B 15
- potential equalization	
Ceiling Installation above suspended ceiling with collective fastening	B 16
- 2 recess-mounted ceiling light fixtures 1xL36W with prismatic cover type of protection IP 54	B 17
- 1 fan connection 5-wired (230V, 2 speeds, follow-up)	B 18
	B 19
	B 20
	B 21
	B 22
	B 23
	B 24
	B 25

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		SOURCE
(2)		
APARTMENTS TYPE 2		B 01
Room depth between 5.20 and 5.99 m	Fig. 14.29	
(2.1)		
2 Bedrooms equipped with each		B 02
Wall		
Flush-mounted installation		
- at the bed above night stand	1 change-over switch 1.00 m above FFL for the ceiling light in bed area 2 Schuko receptacles 230 V, 0.35 m aFFL, 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL	B 03
- at desk	2 Schuko receptacles 230 V, 0.63 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.49 m aFFL 1 telephone connection socket TELEKOM 0.35 m aFFL	B 04
- at the TV	2 Schuko receptacles 230 V, 0.35 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL 1 TV antenna receptacle, 0.35 m aFFL	B 05
- at bathroom door each	1 change-over switch with illuminated large area rocker 0.951 m aFFL, for switching of lighting and ventilation, 2 nd step with follow-up	B 06
- at door by closet	1 switch with illuminated large area rocker 0.951 m aFFL	B 07
- at entrance door	1 change-over switch for the first ceiling light in bed area 1.05 m aFFL 1 off-switch for the 2. ceiling light, below 1 Schuko receptacle 230 V, below	B 08
Ceiling		
Flush-mounted installation and/or above suspended ceiling		
2 surface-mounted ceiling light fixtures with aluminum mirror louver 2xL36W 1 optical smoke detector 230 V with integrated signal transmitter 85 B(A) for local alarm signals, no alarm transfer to (BMZ)		B 09
(2.2)		B 10
2 closet rooms equipped with each		
Wall		
Flush-mounted installation		B 11
- 1 distribution/room 230/120V, flush-mounted, in corridor wall, top edge = 1.90 m aFFL		B 12
Ceiling		
Flush-mounted installation		
- 1 surface-mounted ceiling light fixture with prismatic cover 2x TC 11 W		B 13
		B 14
		B 15

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USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
(2.3) 2 kitchenettes equipped with each	B 01
Wall Flush-mounted installation	B 02
- 2 Schuko receptacles 230 V, 1.26 m aFFL - 1 Schuko receptacle 230 V, 1.96 m aFFL – for microwave - 2 receptacles NEMA 120V/20A, 1.26 m aFFL - 1 Schuko receptacle 230 V, 0.36 aFFL for the refrigerator	B 03
(2.4) 1 Bathroom (combined) (power circuit supply cables from distribution/floor)	B 04
Wall Flush-mounted installation	B 05
- 1 Schuko receptacle 230 V, 1.66 m aFFL - 1 receptacle NEMA 120 V, 1.56 m aFFL - 1 connection 230 V for mirror cabinet light fixture 1.90 m aFFL - potential equalization	B 06
Ceiling Installation above suspended ceiling with collective fastening	B 07
- 2 recess-mounted ceiling light fixtures 1xL36W with prismatic cover Type of Protection IP 54 - 1 fan connection 5-wired (230V, 2 speeds, follow-up)	B 08
<u>Note</u> Apartments Type 1,2 and 4 are equipped with 2 distribution/room, each one adjacent walk-in closet. The bathrooms shall be used by both occupants, however, they can be locked with separate doors from every bedroom. This is why the power circuits for the bathroom cannot be connected at one of the two existing distributions/room, as the switching devices would not be accessible for everybody then. The power circuits for receptacles and lighting incl. drive of 2-step fan of bathrooms are therefore housed in the distribution/floor. The power circuits for the bathroom shall be connected at the distribution/room for apartments type 3, as the distribution will be accessible from both sides.	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

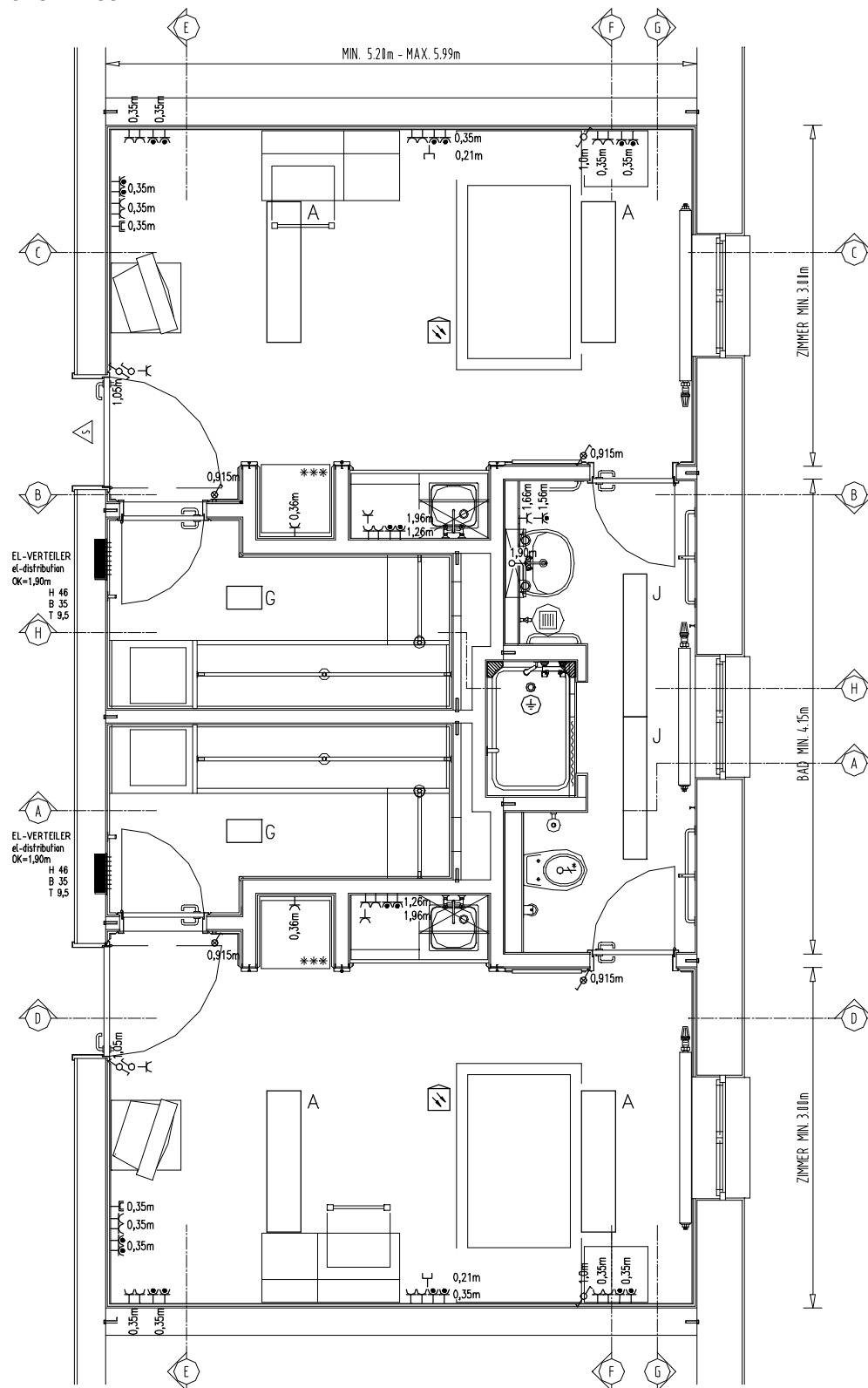
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SOURCE

Fig 14.29

FLOOR PLAN APARTMENT WITH BATHROOM TYPE 2 GRUNDRISS ZIMMEREINHEIT TYP 2



B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

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		SOURCE
(3)		
APARTMENTS TYPE 3		B 01
Room depth 6.0 m Fig. 14.30		
(3.1)		
2 Bedrooms equipped with each		B 02
Wall		
Flush-mounted installation		
- at the bed above night stand	1 change-over switch 1.00 m aFFL for the 1. ceiling light in bed area	B 03
	2 Schuko receptacles 230 V, 0.35 m aFFL, 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL	B 04
- at desk	2 Schuko receptacles 230 V, 0.63 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.49 m aFFL 1 telephone connection socket TELEKOM 0.35 m aFFL	B 05
- at the TV	2 Schuko receptacles 230 V, 0.35 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL 1 TV antenna receptacle, 0.35 m aFFL	B 06
- at bathroom door	1 change-over switch with illuminated large area rocker, 1.05 m aFFL, for switching of lighting and ventilation, 2 nd step with follow-up	B 07
- at door by closet	1 switch with illuminated large area rocker 1.05 m aFFL	B 08
- at upper attic room door	1 change-over switch for the first ceiling light at bed, inside 1.05 m aFFL 1 off-switch for the 2. and 3. ceiling light, below 1 Schuko receptacle 230 V, below	B 09
Ceiling		
Flush-mounted installation and/or above suspended ceiling		B 10
- 2 surface-mounted ceiling light fixtures with aluminum mirror louver 2xL36W		
- 1 optical smoke detector 230 V with integrated signal transmitter 85 dB(A) for local alarm signals, no alarm transfer to (BMZ)		B 11
(3.2)		
2 walk-in closet rooms equipped with each		
Ceiling		B 12
Flush-mounted installation		
- 1 surface-mounted ceiling light fixture with prismatic cover 2xTC11W		B 13
		B 14
		B 15

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SOURCE	
(3.3) Kitchenette (joint)	B 01
Wall Flush-mounted installation	B 02
- 2 Schuko receptacles 230 V, 1.26 m aFFL - 1 Schuko receptacle 230 V, 1.96 m aFFL - 2 receptacles NEMA 120 V/20 A, 1.26 m aFFL - 1 Schuko receptacle 230 V, 0.36 m aFFL - refrigerator - 1 Schuko receptacle 230 V, 1.36 m aFFL above table - 1 receptacle NEMA 120 V/20 A, 1.36 m aFFL above table - 1 intermediate switch at entrance door, 1.05 m aFFL - 1 Schuko receptacle below - each 1 change-over switch at bedroom doors outside, 1.05 m aFFL - 1 living space distribution panel 230 V/120 V flush mounted for both units jointly in partition from walk-in closet room in entrance area top edge = 1.90 aFFL	B 03
Ceiling Flush-mounted installation	B 04
- 2 surface mounted light fixtures with prism tub 1xL36W, protective type IP 50	B 05
(3.4) Bathroom (power circuit cables from distribution/floor)	B 06
Wall Flush-mounted installation	B 07
- 1 Schuko receptacle 230 V, 1.66 m aFFL - 1 receptacle NEMA 120 V, 1.56 m aFFL - 1 connection 230 V for mirror cabinet light fixture 1.90 m aFFL - potential equalization	B 08
Ceiling Installation above suspended ceiling with collective fastening	B 09
- 1 recess-mounted ceiling light fixture 1xL36W with prismatic cover type of protection IP 54 - 1 fan connection 5-wired (230V, 2 speeds, follow-up)	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

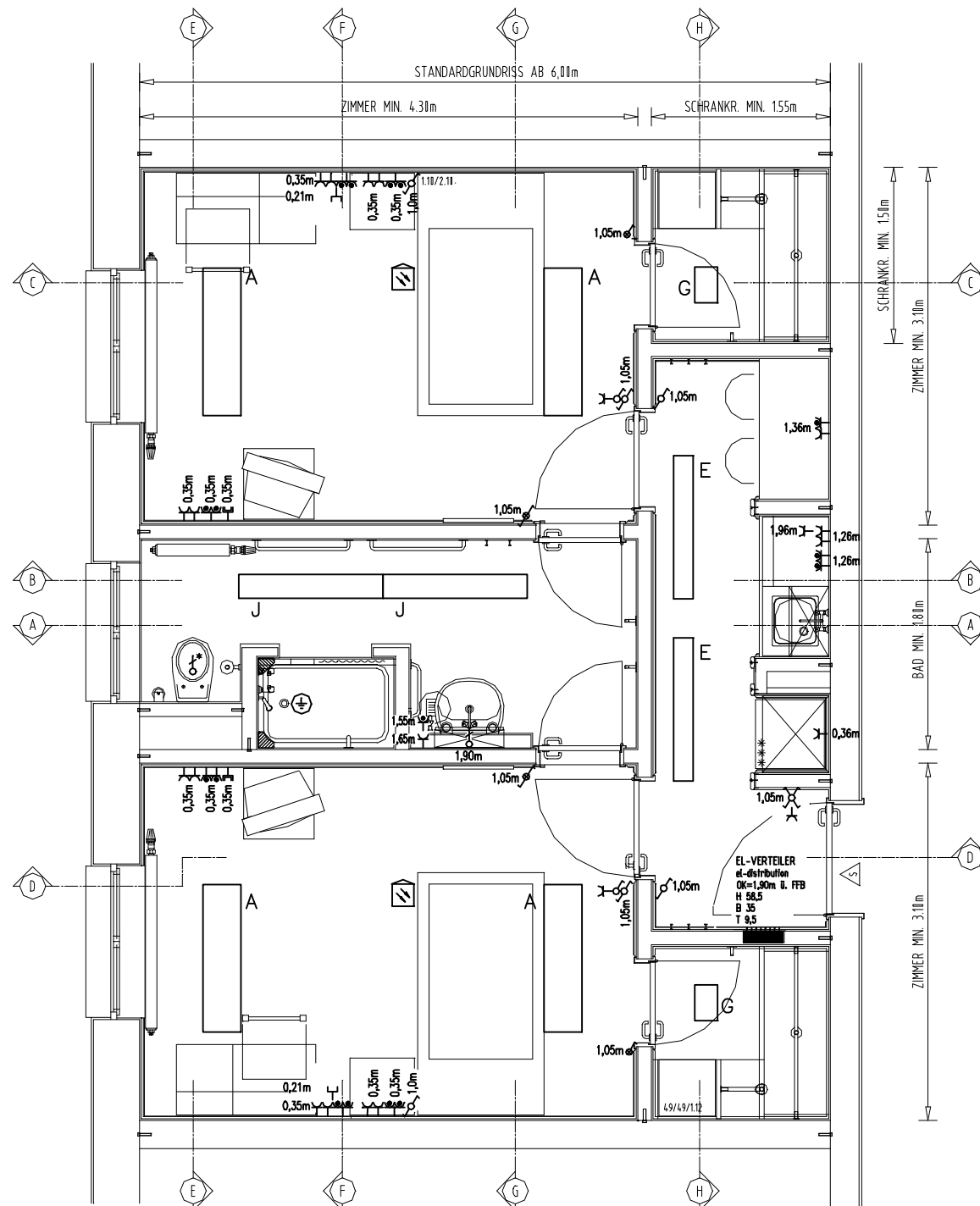
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SOURCE

Fig 14.30

FLOOR PLAN APARTMENT NCO TYPE 3
GRUNDRISS NCO-ZIMMEREINHEIT TYP 3



B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

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		SOURCE
<p>(4) APARTMENTS TYPE 4 with roof slope Fig. 14.31</p> <p>(4.1) 2 Bedrooms equipped with each</p> <p>Wall Flush-mounted installation</p> <ul style="list-style-type: none"> - at the bed above night stand - at desk - at the TV - refrigerator - at bathroom door each - at closet room door - at entrance door <p>Ceiling Flush-mounted installation and/or above suspended ceiling</p> <ul style="list-style-type: none"> 2 surface-mounted ceiling light fixtures with aluminum mirror louver 2xL36W 1 optical smoke detector 230 V with integrated signal transmitter for local alarm signals, no alarm transfer to (BMZ) <p>(4.2) 2 walk-in closets equipped with each</p> <p>Wall Flush-mounted installation</p> <ul style="list-style-type: none"> - 1 distribution/room 230 Vvv/120 v, flush-mounted, in corridor wall, top edge = 1.90 m aFFL <p>Ceiling Flush-mounted installation</p> <ul style="list-style-type: none"> - 1 surface-mounted ceiling light fixture with prismatic cover 	<p>1 change-over switch 1.00 m aFFL for the</p> <ul style="list-style-type: none"> 1. ceiling light in bed area <p>2 Schuko receptacles 230 V, 0.35 m aFFL,</p> <p>1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL</p> <p>2 Schuko receptacles 230 V, 0.63 m aFFL</p> <p>1 duplex receptacle NEMA 120V/20A, 0.49 m aFFL</p> <p>1 telephone connection socket TELEKOM 0.35 m aFFL</p> <p>2 Schuko receptacles 230 V, 0.35 m aFFL</p> <p>1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL</p> <p>1 TV antenna receptacle, 0.35 m aFFL</p> <p>1 Schuko receptacle 230 V, 0.35 m aFFL</p> <p>1 change-over switch with illuminated large area rocker, 0.915 m above FFL, for switching of lighting and ventilation, 2nd step with follow-up</p> <p>1 change-over switch with illuminated large area rocker, 0.915 m aFFL</p> <p>1 change-over switch 1.05 m aFFL for the</p> <ul style="list-style-type: none"> 1. ceiling light in bed area <p>1 off-switch for the 2. ceiling light, below</p> <p>1 Schuko receptacle 230 V, below</p> <p>1 distribution/room 230V/120V, flush-mounted, in corridor wall, top edge = top edge door frame</p>	B 01
		B 02
		B 03
		B 04
		B 05
		B 06
		B 07
		B 08
		B 09
		B 10
		B 11
		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
(4.3) 2 kitchenettes equipped with each	B 01
Wall Flush-mounted installation	B 02
- 2 Schuko receptacles 230 V, 1.26 m aFFL - 1 Schuko receptacle 230 V, 1.96 m aFFL – for microwave - 2 receptacles NEMA 120 V/20 A, 1.26 m aFFL	B 03
(4.4) 1 Bathroom (joint) (power circuit cables from distribution/floor)	B 04
Wall Flush-mounted installation	B 05
- 1 Schuko receptacle 230 V, 1.66 m aFFL - 1 receptacle NEMA 120 V, 1.56 m aFFL - 1 connection 230 V for mirror cabinet light fixture 1.90 m aFFL - potential equalization	B 06
Ceiling Installation above suspended ceiling with collective fastening	B 07
- 2 recess-mounted ceiling light fixtures 1xL36W with prismatic cover Type of Protection IP 54 - 1 fan connection 5-wired (230V, 2 speeds, follow-up)	B 08
	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

USAREUR - Restoration Program of Troop Billets - Standard 1+1

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DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
(5) NCO-APARTMENTS TYPE 5 Standard layout as of 4.90 m Fig. 14.32		B 01
(5.1) Bedroom		B 02
Wall Flush-mounted installation		B 03
- at the bed above night stand	1 change-over switch 1.00 m aFFL for the 1. ceiling light in bed area 2 Schuko receptacles 230 V, 0.35 m aFFL, 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL	B 04
- at desk	2 Schuko receptacles 230 V, 0.63 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.49 m aFFL 1 telephone connection socket TELEKOM 0.35 m aFFL	B 05
- at table	2 Schuko receptacles 230 V, 0.35 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.35m aFFL	B 06
- at the TV	2 Schuko receptacles 230 V, 0.35 m aFFL 1 duplex receptacle NEMA 120V/20A, 0.35 m aFFL 1 TV antenna receptacle, 0.35 m aFFL	B 07
- at bathroom door	1 change-over switch with illuminated large area rocker, 1.05 m aFFL, for switching of lighting and ventilation, 2 nd step with follow-up	B 08
- at closet room door	1 change-over switch with illuminated large area rocker, 1.05 m aFFL	B 09
- at entrance door	1 change-over switch 1.05 m aFFL for the 1. ceiling light in bed area 2 off-switch for the 2. and 3. ceiling light, below 1 Schuko receptacle 230 V, below	B 10
Ceiling Flush-mounted installation and/or above suspended ceiling		B 11
- 3 surface-mounted ceiling light fixtures with aluminum mirror louver 2xL36W - 1 optical smoke detector 230 V with integrated signal transmitter for local alarm signals, no alarm transfer to (BMZ)		B 12
(5.2) Walk-in closet		B 13
Wall Flush-mounted installation		B 14
- 1 distribution/room 230 Vw/120 v, flush-mounted, in corridor wall, top edge = 1.90 m aFFL		B 15
Ceiling Flush-mounted installation		B 14
- 1 surface-mounted ceiling light fixture with prismatic cover 2xTC11W		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
<p>(5.3) Kitchenette</p> <p>Wall Flush-mounted installation</p> <ul style="list-style-type: none"> - 2 Schuko receptacles 230 V, 1.26 m aFFL - 1 Schuko receptacle 230 V, 1.96 m aFFL – for microwave - 2 receptacles NEMA 120 V/20 A, 1.26 m aFFL - 1 Schuko receptacle 230 V, 0.36 m aFFL - refrigerator <p>Ceiling Flush-mounted installation and/or above suspended ceiling</p> <ul style="list-style-type: none"> - 1 surface-mounted ceiling light fixture with prismatic cover 1xL36W <p>(5.4) Bathroom (power circuit cables from distribution/floor)</p> <p>Wall Flush-mounted installation</p> <ul style="list-style-type: none"> - 1 Schuko receptacle 230 V, 1.66 m aFFL - 1 receptacle NEMA 120 V, 1.56 m aFFL - 1 connection 230 V for mirror cabinet light fixture 1.90 m aFFL - potential equalization <p>Ceiling Installation above suspended ceiling with collective fastening</p> <ul style="list-style-type: none"> - 1 recess-mounted ceiling light fixtures 2xL36W with prismatic cover Type of Protection IP 54 - 1 fan connection 5-wired (230V, 2 speeds, follow-up) 	B 01
	B 02
	B 03
	B 04
	B 05
	B 06
	B 07
	B 08
	B 09
	B 10
	B 11
	B 12
	B 13
	B 14
	B 15

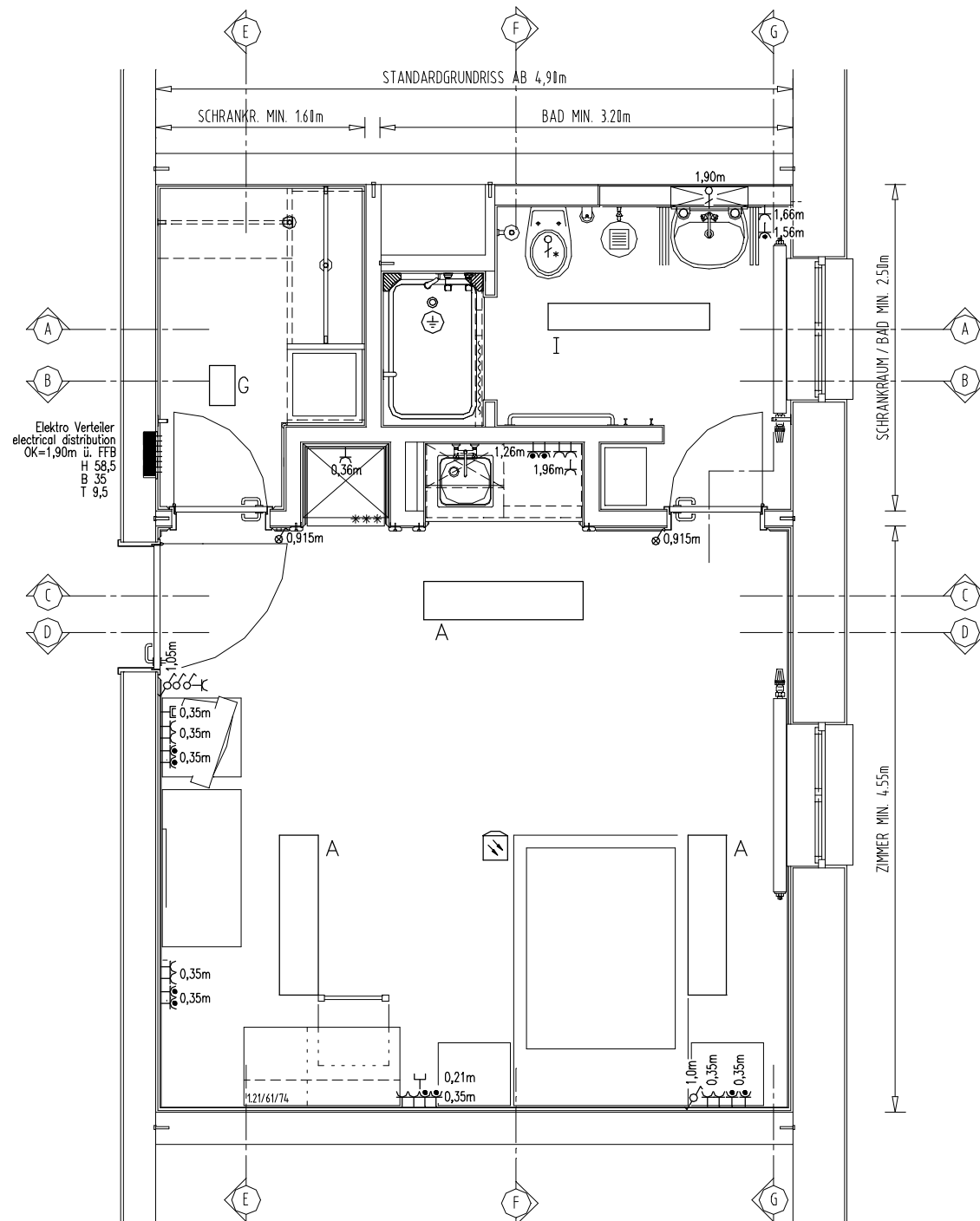
DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE

Fig 14.32

FLOOR PLAN APARTMENT NCO TYPE 5
GRUNDRISS NCO-ZIMMEREINHEIT TYP 5



B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

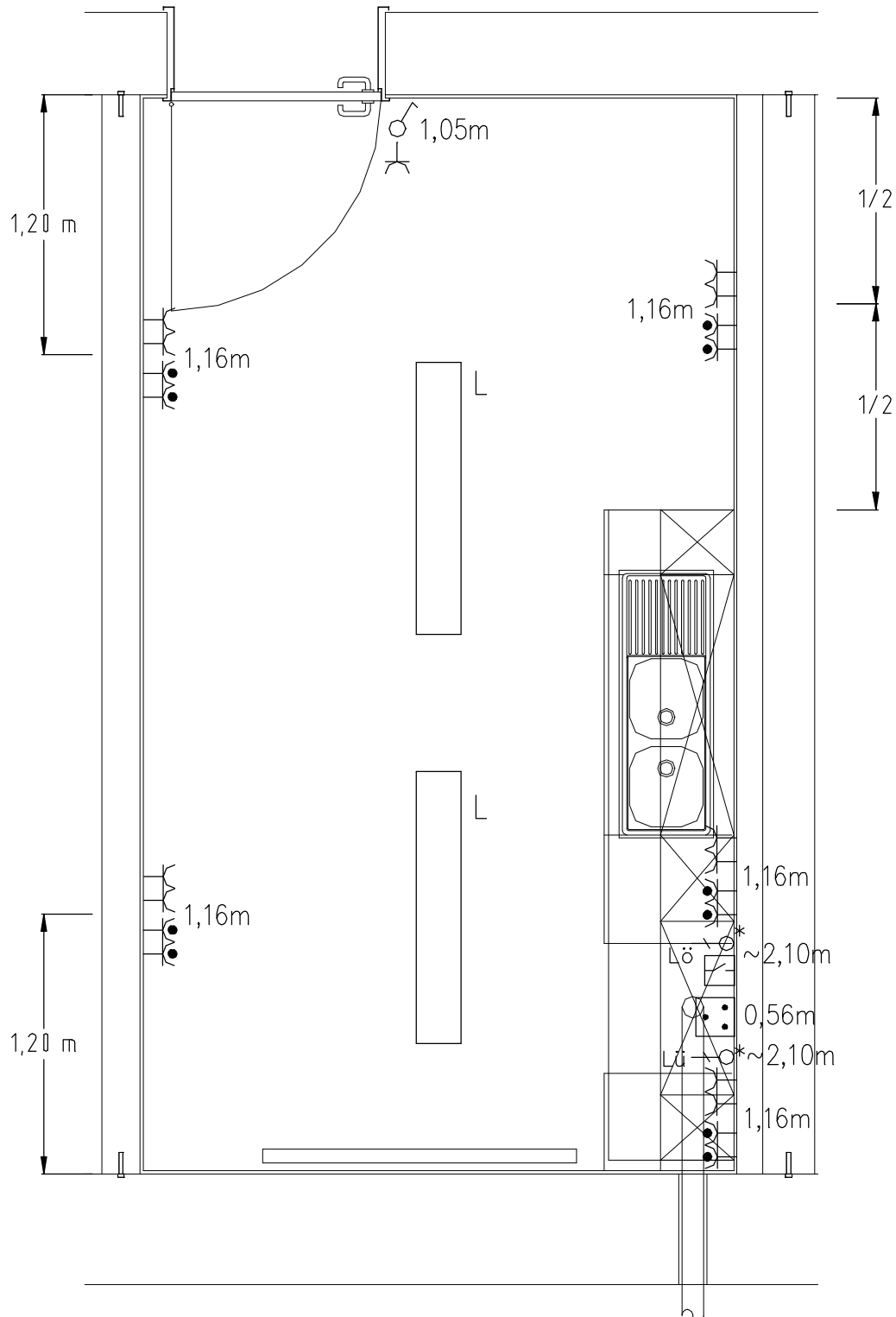
SOURCE	
(6) JANITOR's CLOSETS	B 01
Walls Flush-mounted installation	B 02
1 off-switch for light and ventilation 1.05 m aFFL 1 Schuko receptacle 230 V below switch 1 fan connection with follow-up relay	B 03
Ceiling Flush-mounted installation	B 04
Surface-mounted light fixtures with prismatic covers, type of protection IP 50	B 05
(7) KITCHENS according to equipment plan Fig. 14.33	B 06
Walls Flush-mounted installation/tiled walls	B 07
- 1 off-switch at the door, 1.05 m aFFL - 1 Schuko receptacle 230 V below off-switch	B 08
At kitchen cabinetry - 1 range connection socket with connecting terminals max. 6 mm ² , 5-pole, 400 V AC 0.56 m above FFL, supply cable via cut-out device of extinguishing system - 4 Schuko receptacles 230 V, 1.16 m aFFL - 4 receptacles NEMA 120 V / 20 A, U.S. standard, 1.16 m aFFL - 1 connection 230 V of exhaust hood above range, approx. 2.10 m aFFL - 1 connection of extinguishing device, approx. 2.10 m aFFL - 1 alarm contact of extinguishing device to central fire alarm panel, approx. 2.10 m aFFL	B 09
Beside the kitchen row centered in wall - 2 Schuko receptacles 230 V, 1.16 m aFFL - 2 receptacles NEMA 120 V/20 A, U.S. standard, 1.16 m aFFL	B 10
At the wall across the kitchen row - 4 Schuko receptacles 230 V, 1.16 m aFFL - 4 receptacles NEMA 120 V/20 A, U.S. standard, 1.16 m aFFL	B 11
Ceiling Flush-mounted installation	B 12
- 2 surface-mounted light fixtures with white louver, type of protection IP 20	B 13
	B 14
	B 15

DESIGN GUIDELINES

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Fig 14.33

FLOOR PLAN KITCHEN GRUNDRISS KÜCHE



SOURCE

B 01

B 02

B 03

B 04

B 05

B 06

B 07

B 08

B 09

B 10

B 11

B 12

B 13

B 14

B 15

DESIGN GUIDELINES

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SOURCE	
(8) CORRIDORS (FIRST FLOOR AND TOP FLOOR)	B 01
Walls Installation flush mounted / tiled walls	B 02
<ul style="list-style-type: none"> - Control push button 1.125 m aFFL near entrance doors, doors to staircase arranged to all room doors. - Schuko receptacles 230 V, 1.625 m aFFL arranged alternately at both corridor sides - Information light fixtures EXIT in escape direction - Optical-acoustical alarm transmitter of fire alarm system 104-110 dB(A) with white or transparent flash lamp top edge 10 bottom edge ceiling - Push button detectors of fire alarm system at exits 1.375 m aFFL - 1 up to 3 US telephone connection boxes, each acc. to corridor length 1.375 m aFFL - Connections for door arrester devices from fire alarm central unit - Push button for release of door arrester devices 1.625 m aFFL - Secondary voltage distributor/floor in wall niches or flush mounted - TV distributor (TKS) in wall niches or flush mounted 	B 03
	B 04
	B 05
Entrance Area First Floor in Direction of Fire Department Approach	B 06
<ul style="list-style-type: none"> - jointly in lockable surface mounted sheet steel cabinet: - 1 fire alarm central station with data cards - 1 Fire Department operation panel - 1 main detector and/or 2 modems - 1 connection 230 V for fire alarm central station - 1 site plan of fire alarm system with representation of all levels of building 	B 07
	B 08
Ceiling Installation in I30 ducts above suspended ceilings	B 09
<ul style="list-style-type: none"> - Built-in ceiling light fixtures with white grid, thereof one part as security lighting in permanent switching - Smoke detectors of fire protection doors in ceiling area 	B 10
B 14.3.2 Staircases	
(1) Walls Installation flush mounted and/or in concrete / tiled walls	B 11
<ul style="list-style-type: none"> - Control push buttons at all doors 1.125 m aFFL with pulse relay switching - Schuko receptacles 230 V below push buttons - Connections for door arrester devices from fire alarm central station - Push button for release of door arrester devices 1.625 m aFFL - Push button for operation of smoke heat exhaust system 1.625 m aFFL on first floor and top floor, additionally key switch at main entrance, if requirement of local US Fire Department. 	B 12
	B 13
	B 14
	B 15

DESIGN GUIDELINES

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		SOURCE
Ceiling Installation type flush mounted <ul style="list-style-type: none"> - Built-in ceiling light fixtures with white grid, thereof one part as security lighting in permanent switching - Information light fixtures EXIT in escape directions - Smoke exhaust system with control central station at highest point of stair 		B 01
		B 02
		B 03
B 14.3.3 BASEMENT		
(1) MECHANICAL ROOMS		B 04
Walls Installation on cable tray, in conduit or in cable duct, surface mounted, surface mounted equipment for installations, wet-room type <ul style="list-style-type: none"> - 1 off-switch - 1 Schuko receptacle 230 V below switch - 1 US telephone wall connection box 1.40 m aFFL only in TV room - Supply lines to operation agents of mechanical and DDC system acc. to directions of special designer mechanical system. Connections will be provided by mechanical system. 		B 05
		B 06
		B 07
Ceiling Installation in protective pipe or in conduit or in cable tray surface mounted and/or on cable support <ul style="list-style-type: none"> - Surface mounted light fixtures with prismatic cover, type of protection IP 54, 1 light fixture as security lighting in permanent switching - Optical smoke detector of fire alarm system - Acoustical alarm transmitters of fire alarm system 		B 08
		B 09
(2) LATRINES		B 10
Walls Installation flush mounted / tiled walls <ul style="list-style-type: none"> - 1 off-switch for light and ventilation - 1 mirror light fixture with opal cover above lavatory - 1 wall light fixture with synthetic cover, type of protection IP 65, in shower room - 1 Schuko receptacle 230 V next to lavatory - 1 control switch outside the door to shower cabin - 1 fan connection with follow-up relay - 1 acoustical alarm transmitter of fire alarm system 		B 11
		B 12
Ceiling Installation flush mounted or above suspended ceiling <ul style="list-style-type: none"> - Panel built-in light fixtures with prismatic cover 		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

SOURCE	
(3)	B 01
LAUNDRY	
Installation flush mounted / tiled walls	
All equipment flush mounted in wet-room type	B 02
- Off-switch / change-over switch at the door for several switch groups 1.05 m aFFL	
- Schuko receptacles at the door below switches	
- 1 Schuko receptacle 230 V, 1.30 aFFL above table of each laundry	B 03
- 1 Schuko receptacle 230 V for each washer	
- 1 Schuko receptacle 230 V / 16 A for each dryer	
Ceiling	B 04
Installation flush mounted or on cable gutter	
- Surface mounted light fixtures with prismatic cover, type of protection IP 54	B 05
(4)	
ARMS ROOM	
Walls	B 06
Installation in protective pipe surface mounted, open installation.	
Rigid steel conduit in closed installation with pull wire for alarm system acc. to direction DPW	
- 1 subdistribution panel for light boxes and receptacles in room with fuse circuit breakers and main switch with separate supply line from building distributor	B 07
- Off-switch for switching of lighting in several switch groups	
- 1 Schuko receptacle 230 V below switch, 1 off-switch for bulkhead fittings in corridor	B 08
- 6 Schuko receptacles 230 V distributed in the room	
- 1 US telephone socket	
- 1 connection for central station of check control system 120 V	B 09
- Installation of low voltage cables in rigid steel pipe for monitoring system from central panel to motion alarms, door and window contacts and manual alarms (foot contact etc.) as per authorized US agency's instruction	
- Bulkhead fitting on corridor side between service window and door	B 10
- 1 optical-acoustical alarm transmitter of fire alarm system 104 – 110 dB(A) with white or transparent flash lamp top edge 10 bottom edge ceiling.	
Ceiling	B 11
Installation in open pipe installation type surface mounted	
- Surface mounted light fixtures with prismatic cover, type of protection IP 50	
- 1 light fixture as security lighting in permanent switching	B 12
- Optical smoke detector of fire alarm system	
	B 13
	B 14
	B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
(5)		
MUD ROOM		B 01
Walls		
Installation flush mounted / tiled walls		
<ul style="list-style-type: none"> - Control switch / control change-over switch, wet-room type 1.05 m aFFL outside at door in corridor by room entrance door for light and ventilation - Separate timer with operation push button in flush mounted casing with lettering outside at door in corridor by room entrance door for ventilation with long follow-up and bridging-over switch for continuous operation with pilot light. 		B 02
		B 03
Ceiling		
Installation in protective pipe surface mounted		B 04
<ul style="list-style-type: none"> - Surface mounted light fixtures with prismatic cover, type of protection IP 54 		
(6)		B 05
OFFICE AND/OR STORAGE ROOMS		
The exact room utilization shall be determined with USAREUR acc. to furniture plan upon commencement of design.		
Walls		B 06
Installation flush mounted in masonry or chases in concrete, at new concrete walls in pipe in formwork		
<ul style="list-style-type: none"> - Off-switch / change-over switch 1.05 m aFFL at the door for several switch groups - Each 1 Schuko receptacle 230 V below switches as combination - 1 Schuko double receptacle 230 V per work station, bottom edge = 0.85 m aFFL - 1 double receptacle NEAM 120 V / 20 A, US standard, per work station, bottom edge = 0.85 m aFFL - 1 combined DSN/data box per work station, bottom edge = 0.85 m aFFL - 1 fan connection with follow-up relay in inside located rooms without windows 		B 07
		B 08
Ceiling		
Installation on cable gutters and/or with cable binders to raw ceiling above suspended ceiling		
<ul style="list-style-type: none"> - Built-in light fixtures with darklight mirror grid if no suspended ceiling is possible, surface mounted darklight light fixtures acc. to coordination with DPW. 		B 09
		B 10
(7)		B 11
CORRIDORS		
Walls		
Installation type flush mounted and/or in pipe in concrete formwork		
<ul style="list-style-type: none"> - Control push buttons at all doors 1.05 m aFFL - Schuko receptacles 230 V in distance of 5 m, alternating sides, 1.30 m aFFL - Secondary voltage sub distributor in wall niches or flush mounted - 1 bulkhead fitting between door and service window of arms room - Information light fixtures EXIT in escape direction at staircase doors - Optical-acoustical alarm transmitter of fire alarm system 104-110 dB(A) with white or transparent flash lamp top edge = 10 bottom edge ceiling. - Push button alarms of fire alarm system in escape routes 1.40 m aFFL - Connections 230 V for door arrester devices from fire alarm central station - Push buttons for release of door arrester devices - 1 US telephone wall connection box in vicinity of door to arms room 1.40 m aFFL 		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
Ceiling Installation type in fire resistant installation units FW class I 30 - Support profile light fixtures with white lamella grid, thereof one part as security lighting in permanent switching - Smoke detector of door arrester devices		B 01
		B 02
		B 03
B 14.3.4 ATTIC		
(1)		
GAME ROOM		B 04
(1.1)		
Walls		
Installation flush mounted, in gypsum plasterboard walls		B 05
- Off-switch for switching of several switch circuits, 1.05 m aFFL - 1 Schuko receptacle 230 V below switches - Schuko double receptacles 230 V and receptacles NEMA 120 V/20 A US standard in room 0.30 m aFFL arranged acc. to furniture plan of USAREUR - 2 TV antenna receptacles, 0.35 m aFFL		B 06
Ceiling		B 07
Installation flush mounted and/or below suspended ceiling		
- Ceiling light fixtures with dark light mirror grid		B 08
(2)		
STORAGE BIN ROOMS/LUGGAGE SOLDIERS		
Installation flush mounted and/or in stud walls		B 09
- Off-switch / alternate switch 1.05 m aFFL - Schuko receptacles 230 V below switch - Schuko receptacles 230 V distributed in room, 0.30 m aFFL - Receptacles NEMA 120 V / 20 A, US standard, distributed in room 0.30 m aFFL - Floor distributor in flush mounted make where possible, instead of in corridor (escape route) - Arrangement of devices acc. to room division plan		B 10
Ceiling		B 11
Installation flush mounted		
Surface mounted light fixtures with prismatic cover, type of protection IP 50		B 12
		B 13
		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE
(3)	LATRINES	B 01
	Walls Installation flush mounted and/or in stud walls	B 02
	<ul style="list-style-type: none"> - 1 off-switch at the door 1.05 m aFFL - 1 Schuko receptacle 230 V below - 1 fan connection - 1 mirror light fixture with opalic cover at the wall above lavatory - 1 Schuko receptacle 230 V at lavatory 	B 03
	Ceiling Installation above suspended ceiling Panel built-in light fixture with prismatic cover, type of protection IP 54	B 04
(4)	TELEPHONE ROOM	B 05
	Walls Installation flush mounted and/or in stud walls	B 06
	<ul style="list-style-type: none"> - 1 off-switch at the door 1.05 m aFFL - 1 Schuko receptacle below - Schuko receptacles 230 V 1.10 m aFFL, as required - receptacle NEMA 120 V / U.S. standard 1.10 m aFFL, as required - RJ-45 telephone connection sockets/TELEKOM 1.10 m aFFL, as required - 1 acoustical alarm transmitter of fire alarm system 	B 07
	Ceiling Installation as described at under item 14.1.3.3 (1.3)	B 08
	<ul style="list-style-type: none"> - Surface mounted light fixtures with prismatic cover 1 x L 36 W thereof one light fixture as security lighting in permanent switching 	B 09
(5)	CORRIDOR ATTIC As far as structural deviating from corridors on top floors	B 10
	Walls Installation in stud walls	B 11
	<ul style="list-style-type: none"> - Control push button at all doors 1.05 m aFFL - Schuko receptacles 230 V, 1.60 m aFFL in distance of 5 m arranged alternately on both corridor sides - Optical-acoustical alarm transmitter 104 – 110 dB(A) of fire alarm system with white or transparent flash lamp. - Push button alarms of fire alarm system at exits 1.40 m aFFL - 1 up to 3 US telephone connection sockets each acc. to corridor length 1.40 m aFFL - Push buttons for release of door arrester devices from fire alarm central station - Push button for release of door arrester devices 1.60 m aFFL - Information light fixtures EXIT in escape direction 	B 12
	Ceiling Installation as described under item 14.1.3.3 (1.3)	B 13
	<ul style="list-style-type: none"> - Surface mounted light fixtures with white grid 1 x L 36 W thereof one part as as security lighting in permanent switching - Smoke detector of door arrester devices 	B 14
		B 15

DESIGN GUIDELINES

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		SOURCE
B 14.3.5	ROOF SPACE ABOVE ATTIC	B 01
Installation in pipe surface mounted in open installation type		
<ul style="list-style-type: none"> - 1 off-switch and/or alternate switch for individual fire section areas - 1 Schuko receptacle 230 V for each area - surface mounted light fixture with prism cover, type of protection IP 50 - Maximum-differential-heat detectors 		B 02
		B 03
B 14.4	INSTALLATION OUTSIDE THE BUILDING	
Walls		B 04
Installation flush mounted		
At main entrances:		B 05
<ul style="list-style-type: none"> - Each 1 wall light fixture on both sides right and left near the entrance doors or above door or canopy, light fixture type acc. to coordination with DPW, thereof 1 light fixture as security lighting - switching as described under item 14.1.7.2 (3) - 1 red flash lamp of fire alarm system at main entrance - single 220 V / 16 A / 50 Hz (SCHUKO) receptacles by door 		B 06
The switching of exterior light fixtures will be accomplished analogous to existing local exterior lighting and/or acc. to coordination with DPW.		B 07
B 14.5	DISMANTLING WORK	
(1)		B 08
The entire secondary voltage and weak current installation incl. all installation systems and operation agents will be dismantled as a rule.		
Deviations thereof shall be coordinated with the responsible DPW and/or competent authorities (Sign. Batt, MP etc.) upon commencement of design.		B 09
(2)		B 10
The scope of installation to be dismantled shall be determined and recorded at the site. All flush mounted installation parts shall be also removed at a complete dismantling. The costs shall be included in cost estimate.		
(3)		B 11
Dismantled system parts and operation agents shall be offered to DPW for further utilization. The turn-over shall be accomplished with proof in case of requirement.		
(4)		B 12
If there is no requirement, the material shall be transported and disposed acc. to legal regulations.		
(5)		B 13
The contractor shall deliver a certificate of the disposal company concerning the disposal of contaminated parts (fluorescent lamps, condensators, etc.).		B 14
		B 15

DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
B 14.6	DESIGN DOCUMENTS		B 01
(1)	Installation layouts acc. to DIN where all systems and operation agents of electrical installation are represented.	DIN EN 61082 Part 1 and 2 DIN 40900-11	B 02
(2)	One-line diagrams acc. to DIN as overview for systems, distributors, consumers etc., important conditions between main functions and operation devices, with information of location, destination, size and dimension.		B 03
(3)	One-line diagram of installations as function and/or installation overview scheme, in which all connections between central facilities and devices of one system type (telephone, data, fire alarm system, security lighting network etc.) as well as connections between devices are represented.		B 04
(4)	Plan symbols		B 05
	All plan symbols used on plans shall be summarized in legends together with the definition of symbol.	DIN 40900	B 06
	Symbols acc. to DIN		B 07
	Letter types acc. to DIN		B 08
	Letter height of definition of symbol min. 2.5 mm.		B 09
	The symbols shall be summarized in the plan legend acc. to systems, e.g. distributions, switch devices, light fixtures, communication systems, lightning protection system etc.		B 10
B 14.7	INSPECTION DOCUMENTS		B 11
(1)	All documents shall be delivered in German and English language.		B 12
(2)	Following listed documents shall be delivered each <u>in triplicate make</u> in DINA A4-folders, filed with table of contents.		B 13
	- Descriptions of systems with brochures and technical documents of all aggregates (firm lists with ordering data)		B 14
	- Operation regulations and operation instructions, supplemented by overall plans (symbol switch plan) provided with short operation instructions, suitable for installation in operation rooms.		B 15
	- Maintenance plans for the delivered devices and equipment, summary of technical data of system dimensioning with appropriate corrections taken as basis, if these have changed in contrary to the design at accomplishment.		
	- Written statement that all electrical systems and connected devices incl. installation were accomplished acc. to valid VDE-regulations as well as measurement reports concerning accomplished isolation and loop resistance measurements.		

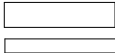


















DESIGN GUIDELINES

USAREUR - Restoration Program of Troop Billets - Standard 1+1

		SOURCE	
<ul style="list-style-type: none"> - As-built plans with complete representation of systems in layout, if required in elevation and/or section with all distributor, control and wiring plans, principle and installation scheme as paper plot/white print additional 	1 set	transparent plots/blue-prints in rolls	B 01
	1 set	paper plot/white print disposed in individual distributors in plan pockets, single	B 02
	1 set	plans on CD-ROM, in duplicate	B 03
			B 04
B 14.8 INSPECTION		ISO 9660	
(1) VOB § 8 is taken as basis for the inspection conditions.			B 05
(2) The inspection cannot be accomplished until completion of systems and availability of required inspection documents and as-built plans.			B 06
(3) The dates for inspections and instructions shall be coordinated with the responsible DPW and determined in writing.			B 07
(4) Additional representatives of following listed responsible authorities shall be present at special inspections			B 08
- Signal Battalion		for telephone and data networks	B 09
- Military Police		for alarm system in arms room	B 10
- Telekom Kabel Service (TKS)		for the complete antenna broad band cable network	B 11
- US Fire Protection Office		for fire alarm system, rescue sign lighting, smoke protection doors, smoke exhaust systems (RWA) and automatic extinguishing facilities in kitchens	B 12
			B 13
			B 14
			B 15

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B 14.9	SOURCE
LEGENDE RAUMGRUNDRISSSE	B 01
Fig 14.34	
LEGEND FOR FIG. 14.28, FIG. 14.29, FIG 14.30, FIG 14.31, FIG 14.32 UND FIG 14.33. LEGENDE FÜR DIE FIG. 14.28, FIG. 14.29, FIG 14.30, FIG 14.31, FIG 14.32 UND FIG 14.33.	B 02
LEGEND LEGENDE	B 03
 LIGHTING FIXTURE LEUCHTE	B 04
 ON-OFF-SWITCH SINGLE AUSSCHALTER 1POLIG	B 05
 ON-OFF-SWITCH ILLUMINATED KONTROLL-AUSSCHALTER	B 06
 CHANGE-OVER SWITCH WECHSELSCHALTER	B 07
 CHANGE-OVER SWITCH ILLUMINATED WECHSELSCHALTER MIT KONTROLLEUCHTE	B 08
 MULTI CIRCUIT SWITCH KREUZSCHALTER	B 09
 EARTHING CONTACT RECEPTACLE 230 V SCHUTZKONTAKTSTECKDOSE 230 V	B 10
 RECEPTACLE NEMA 120 V US-STECKDOSE 120 V	B 11
 EL. RANGE ELEKTROHERD	B 12
 CONNECTION 230 V FAN ANSCHLUSS 230 V LÜFTER	B 13
 CONNECTION 230 V EXTINGUISHING HOOD SYSTEM ANSCHLUSS 230 V LÖSCHANLAGE	B 14
 CONNECTION 230 V FAN WITH 2 SPEEDS ANSCHLUSS 230 V LÜFTER 2 DREHZAHLEN	B 15
 GROUNDING CONNECTION ERDUNGSANSCHLUSS	
 TELEPHONE CONNECTING TAE 6 F TELEFONANSCHLUSSDOSE TAE 6 F	
 US-TELEPHONE CONNECTING 6 POLE TELEFONANSCHLUSSDOSE NACH US-NORM 6POLIG	
 SUB DISTRIBUTION UNTERVERTEILUNG	
 EXACT LOCATION AS PER DIRECTIVE OF THE TECHNICAL TRADES GENAUE LAGE NACH ANGABEN DER HAUSTECHNIK	
 SMOKE DETECTOR WITH BUZZER 230 V RAUCHMELDER MIT SUMMER 230 V	
 ALARM CONTACT EXTINGUISHING HOOD SYSTEM MELDEKONTAKT LÖSCHANLAGE	